ELECTRONIC SERVICE REQUESTED

January 11, 2013

Volume 35 Number 1 www.processor.com

Address Changes: (800) 733-3809 or Fax: (402) 479-2193 Advertising Sales: (800) 247-4880 or Fax: (402) 479-2104

PROCESSOR.

Products, News & Information Data Centers Can Trust.

Since 1979

Providing Business Solutions To Small & Midsized Organizations

NeweggBusiness Has More Than 60,000 Items Available & Ready To Be Shipped

SERVER SYSTEMS. Desktops and laptops. Network attached storage systems and SSDs. Security software. Laser printers. Telephones. Data recovery services. If you're running a company's IT department or data center, chances are you or someone on your team is responsible for purchasing these things and more.

In a world where there are plenty of options for purchasing the equipment you need to run your business, you need a supplier you can trust. NeweggBusiness is that partner.

NeweggBusiness is backed by the leading electronics e-tailer Newegg Inc., which created the business-to-business website in 2009 to help meet the needs of businesses, government and healthcare organizations, and educational institutions. Today, small business owners, CEOs, teachers, independent contractors, government employees, and others rely on NeweggBusiness.com to fulfill their IT and office supply needs.

"We recognized that there was a need for an IT and office products e-retailer that sold specifically to this large market. NeweggBusiness offers its SMB customers a wide product selection, competitive prices, great customer service, and most importantly, it's conveniently available 24 hours a day, seven days a week," says Annie Yeh, vice president of NeweggBusiness.

IT, Simplified

"We Make IT Simple." It's a straightforward statement that serves as the motto for NeweggBusiness. And it backs up that motto with top-of-the-line customer service and highly competitive pricing. NeweggBusiness specializes in providing IT and office products across all industries and has access to more than 1 million square feet of warehouse space in the United States alone.

"Our goal is to be the ultimate online solution center for SMBs," Yeh says. "NeweggBusiness offers SMBs a simple, self-serve platform with 24/7 access to purchase any IT and office supply products they need." The site currently has more than 60,000 computer and office products available, she says.

As a customer of NeweggBusiness, you'll benefit from:

• Superb customer service. Newegg's customer service is available via email

- and phone on weekdays from 5:30 a.m. to 5:30 p.m. Pacific Time.
- **Net 30-day terms.** Order today and pay in 30 days (pending application and approval).
- Volume discounts. More than 80% of products on the NeweggBusiness site have volume pricing available, so the more you buy, the more you save.
- Huge selection. On the NeweggBusiness site, you can choose from more than 60,000 computer and office products that are aimed at business needs.
- **Fast shipping.** 99% of all orders are shipped the same day.

Get Started

It's free and easy to get started: Simply create a NeweggBusiness account by supplying a valid email address, password, contact information, and federal tax ID number (EIN). You can even add several different users on the account with varying degrees of access to the account information. This allows businesses with multiple offices to easily make purchases from a single account.

For the account owner, NeweggBusiness offers easy account management features, including the ability to monitor spending, download invoices, and track the status of orders. You can also review order history, create To-Buy lists, and more.

Once you've created an account, navigate to the products you want to purchase. The NeweggBusiness website is easy to get around. Yeh says the site offers detailed product descriptions and high-resolution images for all of the products. Plus, an intelligent onsite search engine, "order by item number" feature, and faceted navigation make it easy for customers to find the products they need on NeweggBusiness.

NeweggBusiness also lets you know the real-time inventory of each product. If an item has fewer than 20 in stock, you'll be alerted so you can plan your purchases accordingly. From the order screen, you'll also be able to add warranties and other suggested products.

For purchases that are more than 400 pounds, your order can qualify for trucking. You'll be able to compare the cost of regular UPS shipping and trucking right to your business location, regardless of whether you have a loading dock.



NeweggBusiness also offers data recovery services through DriveSavers. You can choose from several different plans, including data recovery plans for laptops, desktops, and hard drives. If you're already experiencing a data loss and don't have a recovery service, DriveSavers may still be able to help.

Exclusive Deals, Product Finders & More

In addition to the low prices Newegg-Business is able to offer on all types of IT and office products, the company offers regular exclusive deals, partnering with manufacturers to offer even better discounts on select products. Plus, you can sign up to receive the NeweggBusiness E-Blast, which includes information on the best deals, exclusive promotions, sweepstakes, and advanced product previews.

The NeweggBusiness site also includes other valuable tools aimed at helping with product purchases. Universal Power Supply, Ink & Toner, Memory, and Cable finder tools help by providing basic information, links, and graphics to pinpoint what you're looking for and ensure you get the right product the first time.

"NeweggBusiness has a number of resources available to SMBs, including a great product selection, how-to videos, and reliable reviews," Yeh says. "We're committed to building out these resources in order to serve the SMB community and their growing professional needs. We want to be a one-stop shop for small and medium-sized businesses everywhere."

Contact: sales@neweggbusiness.com www.neweggbusiness.com

Subscribe Today/Address Change Form For address change, fill out form below with new information and mail or fax. What type of subscription request is this? ☐ New ☐ Renewal ☐ Cancel © Copyright 2013 by Sandhills Publishing Company. All rights reserved. Reproduction of material appearing _____ Fax: (_____) __ Society and the construction of inflaterial to insuring company. An inginis reserved, reproduction of inflaterial to inflaterial to inflaterial to a registered transport of the consent. Processor is a registered transport. Sandhills Publishing Company. Contact Name: Company Name: _ P.O. Box 82545 Lincoln, NE 68501-2545 Address: _ State: _____ Postal Code: _ 120 W. Harvest Drive Lincoln, NE 68521 Country: Web Address: Advertising: (800) 247-4880 (402) 479-2141 1. What is the size of your company 3. What is your annual computer hardware/ software purchasing budget? Fax: (402) 479-2104 (how many employees)? ☐ Less than 10 □ 200 to 499 □ \$0 to \$9.999 □ \$100.000 to \$249.999 □ 500 to 999 □ \$10,000 to \$24,999 □ \$250,000 to \$499,999 □ 10 to 99 Circulation: (800) 334-7458 □ \$500,000 to \$999,000 □ 1,000+ □ \$25,000 to \$49,999 □ 100 to 199 (402) 479-2132 □ \$50,000 to \$99,999 □ \$1,000,000+ 2. How often do you purchase computer hardware/software? Fax: (402) 479-2193 www.Processor.com □ Weekly□ Bi-weekly Quarterly email: feedback@Processor.com Annually ■ Monthly ■ No Involvement



FEATURED PRODUCT

Cooling That's Effective, Affordable & Energy-Saving

Evaporative Cooling Completely Eliminates Need For Compressor-Based Systems

ONE OF THE BIG NAMES in server manufacturing recently released a new generation of servers that will work very well under the new ASHRAE TC 9.9 guidelines for data center design and operation.

This new generation of servers can handle temperature extremes of up to 45 degrees Celsius, or 113 degrees Fahrenheit, for up to 90 hours per year. One of the rationales behind marketing the server at those conditions was to allow fresh air cooling in virtually the entire continental United States. Other research has indicated that the servers can

operate 87% of the year in Washington, D.C., using fresh air cooling alone.

Energy-Saving Potential

The energy-saving potential of raising the inlet temperatures that high can be enormous. Instead of running chillers or compressors 8,760 hours a year, they are only operating 1,138 hours per year.

It's difficult to put that into numbers, but here's a little example:

If the server power consumption is 300 watts, then the cooling system must



remove 300 watts times 8,760 hours per year or 2,628kWh of heat (8,961,480 BTU). That can be accomplished using mechanical cooling, fresh air cooling, or a combination of the two.

A pretty efficient compressorized HVAC system will remove about 4.5 watts of heat per watt of electrical energy used. So to cool the new server using mechanical cooling will require 2,628,000 watts of heat divided by 4.5, or 584kWh of compressor power.

To cool that same server using fresh air for 87% of the year will only require 75.8 kWh of compressor power. Of course, the fan energy stays the same in both cases, but the compressor savings of 508.2kWh per server can really start to add up.

At an aggressive electric rate of 4.5 cents per kWh, that amounts to \$22.87 per server per year. At modest densities of, say, 40 servers per rack, the savings amounts to \$915 per rack per year. Now consider how many racks are in the typical server room or data center. If the data center has a server load of 1mW, then a density of 40, 300-watt servers per rack will translate into 83 racks. So the annual savings would be almost \$76,000 in this example.

MESTEX AZTEC EVAPORATIVE COOLING SYSTEM

(214) 819-5262 www.mestex.com

Can be configured to provide indirect evaporative, indirect/direct evaporative, or evaporative cooling with DX (direct expansion) or ChW (chilled water) supplemental cooling.



Even Greater Savings

To make the savings even greater, you could use the Aztec ASC indirect evaporative cooling system. Using the Aztec system completely eliminates the compressor-based cooling, adding another \$3.50 per server per year of savings. That would add another \$11,620 per year in savings for a total annual savings of \$87,620 in this example.

Of course each climate and data center is different, and Aztec analyzes each case. But the reduction in operating costs are significant in every case that Aztec has studied.

Aztec and its sister company, Alton, have been in the evaporative cooling business for 66 years. Many of the evaporative cooling technologies that are just now being introduced to the market were developed more than 20 years ago by Aztec. Our experience, combined with our state-of-the-art controls, can assure you of the most efficient evaporative cooling solution available.

FEATURED PRODUCT

Find & Recover Data Center Performance & Capacity

Future Facilities Helps Fortune 20 Company Get Back On Track

WHEN BUILDING A NEW DATA CENTER | fragmentation of infrastructure resources or making upgrades to an existing facility, companies are careful to plan ahead for capacity to make sure that the data center can handle network traffic, storage requirements, and other important employee and customer needs both now and into the future. But even the bestlaid plans meet unforeseen challenges that, over time, will negatively affect data center capacity.

The data center at a Fortune 20 company was originally set up to support 980kW of IT load. But it reached a breaking point when its IT load grew to 688kW. Cooling became unavailable to portions of the IT load, and adding additional IT load was deemed too risky. Using the 6SigmaDC software suite, a series of IT load simulations, and the knowledge that most capacity loss issues are the result of space, power, and cooling fragmentation, Future Facilities and the company were able to immediately spot the trouble areas in the current state of the facility.

Future Facilities' 6SigmaDC solution is designed to predict and visualize and integrate IT and engineering to ensure data centers are running at peak efficiency. It provides a variety of software modules for designing new data centers, planning out upgrades for existing facilities, or as a predictive DCIM tool for making better operational decisions that protect data center capacity over the long term. 6SigmaDC's virtual model of a facility pinpoints design flaws, performance problems or inefficiencies, and ways to optimize your data center layout.

Visualize What Can Be Done

With 6SigmaDC, the Fortune 20 company's data center managers were able to see a three-dimensional virtual representation of the data center and spot the load distribution and cooling issues inherent in the data center's existing layout.

For starters, the facility's IT configuration had evolved differently relative to the design assumption. The load wasn't as uniform throughout the facility as originally planned, and the density on one side of the facility was much greater than the other. Plus, the facility didn't have redundancy included in the deployment plan, which means downtime and maintenance weren't factored into the design.

Using the tools in 6SigmaDC, the company was able to simulate various new equipment installations and configurations to determine the overall impact on capacity. For example, it developed a plan to rotate a row of cabinets 180 degrees as the equipment inside was refreshed over time with the latest hardware. Other cabinet and infrastructure modifications were developed using the 6SigmaDC simulation capability. An optimized list of infrastructure and IT modifications were selected and in 6SigmaDC, sequenced and combined with the IT plans to form a unified data center road map that incrementally reclaimed the lost capacity while avoiding a major infrastructure overhaul.

After utilizing the multiple simulations and layering these changes together, Future Facilities was able to solve almost all of the company's capacity loss issues. Where the company originally had 137 racks and 964 pieces of equipment at risk for lost capacity (395kW, or 40% lost capacity), it cut those numbers down to 18 racks and 73 pieces of equipment at risk (29kW, or

The company's data center, with the predictive DCIM toolset 6SigmaDC, will be more energy efficient, which can save money over time, and will also be able to optimize resource utilization and as a result access the capacity potential of the facility and provide the expected level of performance.

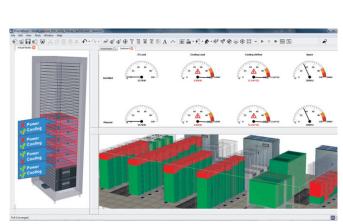
FUTURE FACILITIES 6SIGMADC

(408) 436-7701

3% lost capacity).

www.futurefacilities.com/processor/link.html

Provides a virtual model of a facility that helps to pinpoint design flaws, performance problems or inefficiencies, and ways to optimize your data center layout.



COMPANY TO WATCH

Delivering Lightning Speed Storage DataON Storage Earns First Official Windows Server 2012 Storage Spaces Certification

THE EXPONENTIAL GROWTH in cloud computing is driving the need for highperformance, high-availability, and scalable storage solutions to reduce latency and deliver five nines reliability, while maintaining focus on total cost of ownership (TCO).

To meet these increasing demands, DataON StorageTM, a leading provider of OS-Agnostic Storage Enclosures, is partnering with LSI®, the leadership in SAS Market and leveraging STEC®, The SSD CompanyTM, to provide high-density, high-availability, and highperformance external storage solutions.

As a result of this collaboration, the DLS—Delivering Lightning Speed—clustered storage product line was developed to address the explosive growth of data in cloud and enterprise data centers. This partnership is poised to leverage this best-of-breed technology by driving a solution utilizing Storage Spaces, a new storage capability included in Microsoft Windows Server 2012.

Virtualized Storage

Windows Server 2012 is a cornerstone of the cloud OS. Storage Spaces is a storage virtualization technology included in Windows Server 2012 and is specifically designed for network-attached storage (NAS) and iSCSI storage systems. It includes new capabilities such as data deduplication, the next-generation Resilient File System (ReFS), and Server



Message Block (SMB) 3.0 protocol improvements, and it creates storage pools to enable failover between multiple nodes. For organizations deploying shared services via a private or public cloud, it is imperative to choose technologies that provide features such as pooling, abstraction, fault tolerance, and thin provisioning and furnish it at a fraction of legacy storage hardware costs.

"Storage Spaces is full of game-changing innovations, and DataON Storage provides a universal storage appliance that can help make the most of Storage Spaces breakthrough features," says William Huang, vice president of sales at DataON Storage. "As the first certified JBOD storage enclosure for Windows Server 2012 Storage Spaces, DataON Storage is positioned to deliver enterprise-grade scalable storage solutions to the big data and cloud markets."

Performance Stands Alone

The DataON Storage DNS-1640 JBOD is currently the only external storage certified, tested, and approved by the Windows Server 2012, Storage Spaces team to offer scalable storage capabilities, proven reliability, and performance.

Recent Microsoft test lab results illustrate the enterprise-grade performance of Windows Server

2012, Storage Spaces. The DataON Storage solution delivers very compelling results with a single JBOD storage enclosure to achieve more than 1.45 million I/Ops and sustained throughput of more than 12.6GBps.

"Windows Server 2012 Storage Spaces introduces numerous advancements for private and public cloud customers," states Matt Garson, senior program manager, Microsoft. "We're pleased to welcome DataON Storage as a certified JBOD storage enclosure for Windows Server 2012 Storage Spaces."

These break-neck transfer speeds were achieved using the performance-tuned DLS storage stack from DataON featuring LSI and STEC. The performance numbers are a result of testing a single node configured with the LSI 9207 controllers to a single DataON DNS-1640 6Gbps SAS 24-bay storage shelf leveraging STEC ZeusIOPS dual-ported SAS SSD drives within the Windows Server 2012, Storage Spaces environment.

DataON Storage delivers reliable certified solutions designed for big data, cloud, and enterprise data centers. DataON supports a "Start Small Grow Big" strategy by enabling users to connect the DLS performance enclosures with technology partners for five-nines availability with scale-out file server capabilities in network file system (NFS), SMB (formerly CIFS), and iSCSI environments to give Windows Server 2012 IT administrators a cost-effective appliance solution.

DATAON STORAGE

(714) 441-8820 www.DataONstorage.com

DataON product line includes the 2U 24-bay 2.5" performance-tuned storage enclosure along with 4U 60-bay 3.5" and 24-bay 3.5" JBODs. DataON also provides disk shelf management software DSM 3.1, for NexentaStor and Windows Server 2012.



TOTAL CABLE SOLUTIONS

UNIVERSAL PATCHTM

Universal PATCH™ makes your job easier. With smart numbering,

high density modules and an extreme modular design, the PATCH™

is the answer to your data center's most nagging questions.

• Customized system matches up to most major label plates

• Up to 64-Port duplex LC fits in a 1U design maximizing

· Saves rack space with no need for additional cable

Entitle Tilligitible book

• Modular design features

to accomodate most

(i.e. Brocade, Cisco).

form factors.

space savings.

management

interchangeable brackets

major label (i.e. Corning)

RLE TECHNOLOGIES FMS-FACILITIES MONITORING SYSTEM

The FMS is a feature-rich environmental monitoring system offered at a very competitive price point. Commonly used to monitor equipment status and summary alarms as well as sensors for temperature, humidity, current, voltage, and more, the FMS hosts its own web pages - access the FMS through a web browser to view data and configure the system. The device has no internal moving parts - no hard drives or fans - so it is highly reliable: no crashed hard drives and no downtime! System integration is easy - the FMS is third partner savvy / vendor neutral, so integration options are limitless. Contact RLE for an FMS demo today!

http://rletech.com/product/fms/



(800) 518-1519 | www.rietecn.com

Digital

Brothers

Group

AlphaServer GS160 Model 16

Base System for OpenVMS

• One Alpha 21264 Processor 1224 MHz

• OpenVMS Operating System License

• Additional 1224 MHz CPU w/SMP

Four Quad Building Blocks • One 14-Slot PCI Shelf

DY-160CG-AA

ALSO AVAILABLE:

Additional Memory

• Additional PCI Shelves

Additional PCI Options

770-931-7732

Fax 770-931-9416

www.dbgweb.com

salesp@dbgweb.com

Call or

We Buy Used Cell Phones & pay up to \$150 for each phone Some phones have no value. See current purchase price list for individual model prices at www.pacebutler.com Here's how to do it! Check issued 1 Box cell phones Ship **FREE** (prepaid label online at www.pacebutler.com) We issue your check within 2 days!





(888) 235-2097 | www.TotalCableSolutions.com





That's why we make sure each issue of *Processor* provides comprehensive information in a quick, easy-to-read format.

It's all available both in print and online at www.processor.com.

Call (800) 334-7458 to subscribe to Processor or go to www.processor.com to read articles and view thousands of products online free of charge to qualified readers.



Do you have excess equipment?

Post it for sale on Processor.com!

It's as easy as:

 On the Processor.com home page, click Used/Refurbished Equipment.



2. Choose Post A Free For-Sale Listing.



Follow the on-screen directions from there!

(800) 247-4880 | www.Processor.com

Authorized COMPAQ Reseller **WE WILL BUY YOUR USED HARDWARE!**

2 Systems In Stock!

SUPERMICR®

Fat Iwin

16% Net Power Saving with Supermicro FatTwin™ Solutions



www.youtube.com/Supermicro

- Best Efficiency 16% Less Power Used than Major Competitor
- Best Density 8 Hot-swap 3.5" HDDs per 1U Space
- Best Performance 135W/130W CPU Support
- Supports Intel® Xeon® Processor E5-2600 product family













FatTwin Advantage

FatTwin delivers maximum performance, efficiency and versatility for scientific, research, engineering, and enterprise organizations requiring high-performance, scalable computing and storage solutions for mission-critical applications. The platform is optimized for process intensive database driven applications including Big Data and Hadoop analytics, gas and oil exploration, HPC, computational finance, search engines, design and modeling, simulation and many other applications.







You can't buy Concentration Or Can you?

Buy a UCoustic™ Quiet Server Rack Today

In stock.

ISO 9001:2008









Would you trust your data center power management to anyone but the inventors of the intelligent PDU? Since 1984, Server Technology experts have produced the highest quality rackmount power distribution and monitoring solutions. Built for reliability and performance. All designed to help you manage power capacity, reduce downtime and improve energy efficiency.

SERVER TECH QUALITY POWER ARCHITECTURE

It's the engineering foundation that makes our PDUs the industry standard. For quality and reliability, designed and configured your way, delivered fast.

Contact a Server Tech power expert today.



Quality Rack Power Solutions

www.servertech.com 1-800-835-1515

©2012, Server Technology, Inc



Get ready to see your power grid in

COLOR

Sick of seeing the black labrynth of plain power cables? Then let Total Cable Solutions bring some color to your data center. TCS' color power cables can help differentiate between main and redundant power. By using precise lengths, these ultra-flexible cables allow smooth installation while saving significant cabinet space. Expertly designed for your lab or data center, TCS color power cables are all UL certified and RoHS compliant.







The SureFIT Locking Sleeve creates a strong connection and prevents power cables from being accidentally dislodged. SureFIT TM will work with almost any standard power cable.

AVAILABLE





www.TotalCableSolutions.com

BayTech[®]

33 Years Made in the USA

www.baytech.net

Going Green!!!

Power Factor is Real

and now it's Real-Time with the MRP Power Solution

Reach operational efficiency and conform to new Green Energy standards with the MRP outlet monitoring solutions.

BayTech's metered outlet modules report Amps, Voltage, VA, Watts, power factor and efficiency per receptacle.

Through our secure SNMP engine thresholds can be set to help identify equipment that is running inefficient.

Standard Features

- Single Phase and Three Phase
- 20,30,50,60 Amp Support
- On, Off, Reboot option
- HTTPS, SSH, SSL Access
- Radius, TACACS Authentication
- Tool less Mounting

Unique Features

- · Modular Design
- All Receptacles Monitored
- Power Factor per Outlet
- kW Hour Meter per Outlet
- · Current, Voltage and VA and Watts

- · Reliable PCB Power Distribution
- · Fail Functional Design

Metered Outlet - MRP

Additional Unique Features



All Circuit Breakers Monitored

Most metered power solutions only monitor input power. BayTech monitors all circuit breakers and reports via SNMP when thresholds are met.



Outlet Metering with Efficiency

Monitor individual outlets and receive current, watts, and volt-amps. Continuously monitoring equipment for efficiency with power factor.



Locking C13 Receptacle Optional

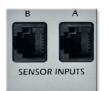
Reliable integrated locking clips assure power cord retention.

Unique to the industry and does away with nuisance wire clips.



Reliable PCB Power Distribution

ISD's (Insulation Displacement) connectors are faulty and unreliable! All BayTech power solutions use reliable PCB power distribution.



Integrated Sensor Inputs

Eliminate the need for extra environmental monitoring devices. All BayTech power solutions offer two ports for external temperature and humidity probes.

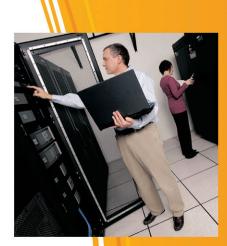
Bay Technical Assoc. Inc. 5239 A Avenue Long Beach, MS 39560 Tel: 228-563-7334 Fax: 228-563-7335 sales@baytech.net

Advanced Technology Solutions









HM Cragg offers a complete Technology Solutions platform that compliments and supports the products we sell. Designed to provide customers an end-to-end support system during and after the product purchasing stage and during the building and design stages.

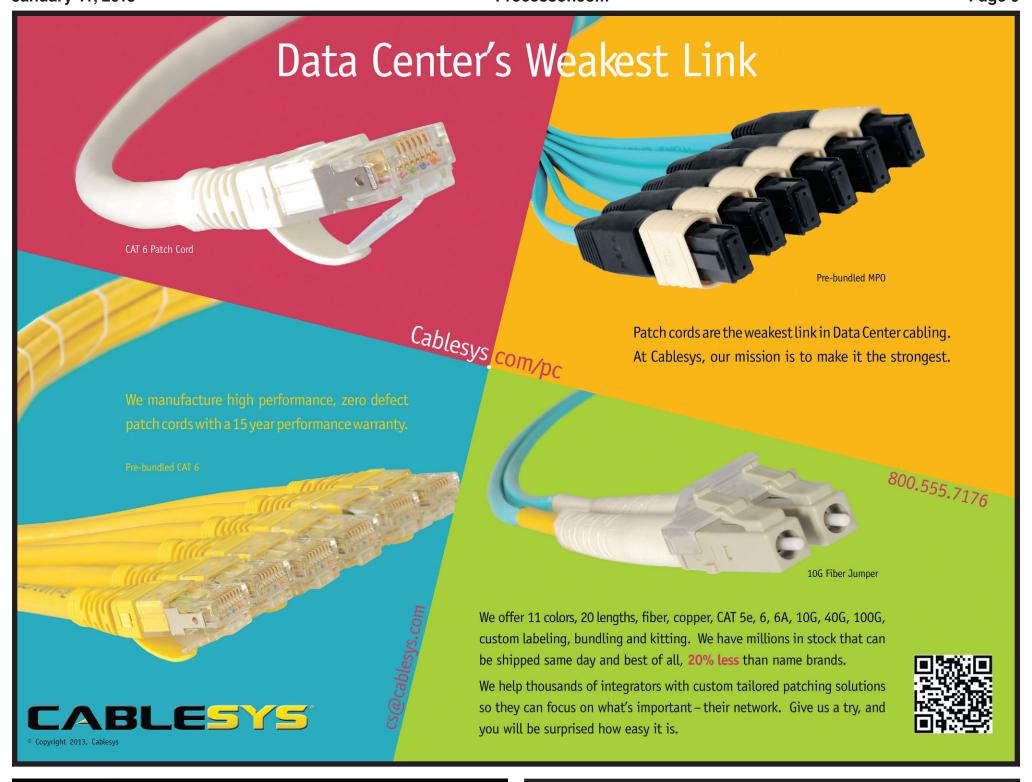
Advanced Technology Solutions include integration services such as:

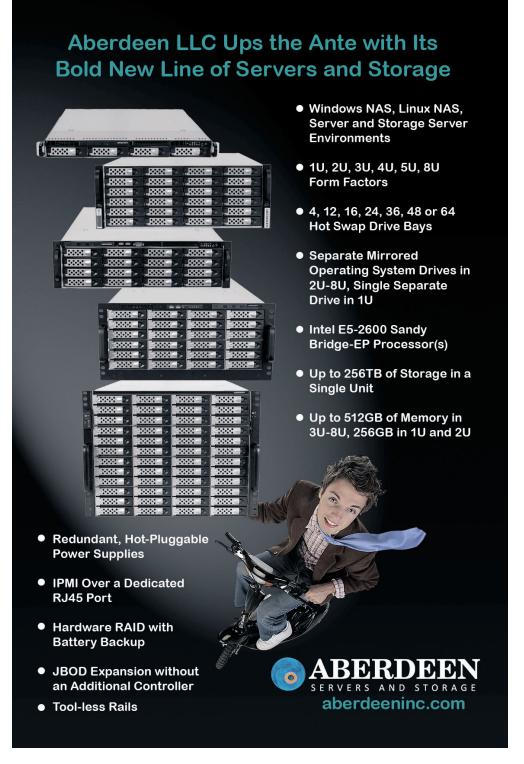
- Web Card Install and Configuration
- Rack Component Building and Staging
- Large Project Rollout Warehousing and Deployment
- Turnkey Data Center Retrofits and Upgrades
- Zero Downtime Fulfillment Strategies
- Project Development Support

Let HM Cragg be your fulfillment channel, and strategic partner with a highly customized and project driven service offering.

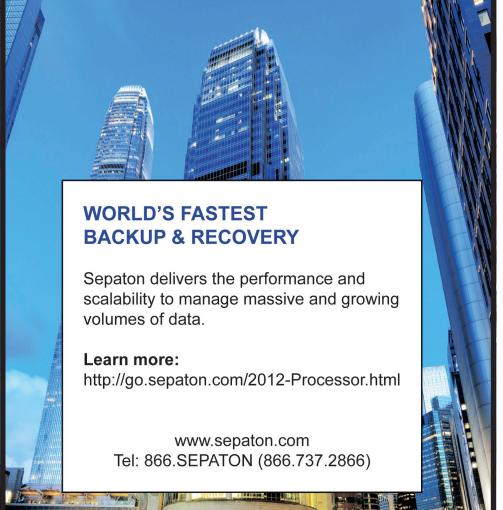


info@hmcragg.com www.hmcragg.com 800.672.7244











Instantly Search Terabytes of Text

- 25+ fielded and full-text search types
- dtSearch's own document filters support "Office," PDF, HTML, XML, ZIP, emails (with nested attachments), and many other file types
- Supports databases as well as static and dynamic websites
- Highlights hits in all of the above
- APIs for .NET, Java, C++, SQL, etc.
- 64-bit and 32-bit; Win and Linux

"lightning fast" Redmond Magazine

"covers all data sources" — eWeek

"results in less than a second" — InfoWorld

hundreds more reviews and developer case studies at www.dtsearch.com

dtSearch products:

- Engine for Win & .NET

- Network with Spider Publish (portable media) Publish (portable media)

 - Document filters also available for separate licensing

Ask about fully-functional evaluations

The Smart Choice for Text Retrieval® since 1991

www.dtSearch.com 1-800-IT-FINDS



PolySim[™] The clear choice!

- Class 1 Fire Rated
- Made in the USA!



Designed for Your Data Center

PolySim, exclusively from Simplex, offers you so many superior qualities in one transparent curtain material over your typical PVC vinyl, all vital to the success of your hot aisle and cold aisle isolation systems.

- Specially formulated thermal plastic urethane, not a PVC. No outgassing, no blooming and reduced cleaning requirements.
- Better for the environment, no dangerous plasticizers or phthalates.
- Permanent antistatic properties that will not diminish over time like vinyl.
- Class 1 fire rated with much lower smoke rating.
- Superior abrasion and tear resistance.

Don't trust your data center to any other curtain material.



Infra Solution $^{\circ}$ S

Smartcard Access Control for Cabinet

PLEX Call your dealer today: 1.800.854.7951

nfra Power® PDU Inspired by Your Data Center



Intelligent kWh PDU

Key Features

- · kWh and Amp monitoring
- Switched & Monitored models
- · Outlet-level measurement
- · Daisy chain ports up to 16 levels
- · Patented IP Dongle for IP Cost Saving
- · SNMP traps and email alerts
- · GUI management software
- · Field replaceable meter with 1.8" LCD
- Tool less Mounting
- · Temp-humid sensor port x2
- · Customization on request
- NEMA 110V / IEC 208V

Option: Surge Protection **EMI Filter**









Austin Hughes Solutions Inc. 8668 Thornton Ave, Newark, CA 94560 inquiry@austin-hughes.com www.austin-hughes.com 1-510-794-2888





Key Features

- · Easy & quick installation
- Designed for IT branded cabinet
- · Universal mounting cut out
- · MiFARE & Proximity compatible
- Double security by master & user cards
- · Individual key lock available
- Free & user friendly management software
- · Accommodates both left & right doors
- · Audio & visual alarm while unauthorized access
- · Door sensors bundled
- Patented smartcard handle design

InfraSolution S series smartcard handle is designed for standalone cabinet.

To look for network and remote control solution,

please send your inquiry to: inquiry@austin-hughes.com www.austin-hughes.com

1-510-794-2888



Austin Hughes Solutions Inc.

8668 Thornton Ave, Newark, CA 94560

CyberView[™]

Rackmount KVM & LCD Console Drawer

1U Widescreen LCD Console Drawer







- LCD Selections :
 - 17" 1920 x 1200 WUXGA resolution
 - 17" Full HD 1080p resolution
- 19" Widescreen 1440 x 900 resolution • HDMI* / DVI / VGA, and Combo KB / mouse
- Wide range KVM integration
- · Short depth design of 18.9" only (22.8" with KVM integration)

Options: SDI input

DC power

Rackmount Widescreen Display Panel







- LCD Selections :
 - 17" 1920 x 1200 WUXGA resolution
 - 21" & 17" Full HD 1080p resolution
- PIP & Picture by Picture viewing efficiency
- · HDMI / DVI / VGA / Speaker

Options : SDI input

Multi-display control Touchscreen DC power

Standalone KVM Switch



- Matrix Cat6 & DB15 KVM switch
- · Combo Cat6 & DB15 KVM switch
- DVI KVM switch
- USB Hub KVM switch

Options: IP Remote access

DC power

AUSTIN

Austin Hughes Solutions Inc. 8668 Thornton Ave, Newark, CA 94560 inquiry@austin-hughes.com www.austin-hughes.com 1-510-794-2888

Pegasus Buys, Sells and Offers Depot Maintenance & Flat Rate Repair On:

Kronos Time Clocks, Flat Panels, POS & Symbol, HHP, PSC, Telxon, Metrologic, **Barcoding Equip**

Point of Sale Terminals & Peripherals

- NCR
- DigiPro & more





- Symbol/Motorola
- HHP
- LXE
- Telxon Datalogic
- Metrologic
- **PSC**



Time Clocks:

We can supply any configuration you need. If you have clocks installed and need a specific KOS version we can help you. Same is true on I/O Boards.

Specialize in 420G, 440B, 460F, 480F, 551, and 4500's





Pegasus Computer Marketing, Inc. (800) 856-2111 www.pegasuscomputer.net





BE INFORMED ABOUT ENVIRONMENTAL ISSUES IN YOUR SERVER ROOM...EVEN WHEN YOU'RE SLEEPING

ONLY SENSAPHONE PRODUCTS CAN CALL AND WAKE YOU WITH A CUSTOM VOICE MESSAGE DESCRIBING THE SPECIFIC PROBLEM WITH SENSOR DETAILS

MAKE SURE YOU **GET THE MESSAGE**

MONITOR:

- TEMPERATURE
- HUMIDITY
- WATER DETECTION
- POWER FAILURE
- & MORE

NOTIFICATION VIA:

- CUSTOM VOICE PHONE CALL
- EMAIL
- TEXT
- SNMP





Call 800.972.6600

Primary, supplemental or emergency cooling for data centers, server & telecom rooms · Portable and ceiling-mount models · Offices

nationwide • On call 24/7

Atlas Sales & Rentals, Inc.
THE PORTABLE COOLING & HEATING SPECIALISTS

www.AtlasSales.com



to Data Center free white paper at

New white Did you know the "K.I.S.S." ("Keep it Simple, paper available! Stupid") principle applies to cooling data centers Applying the and server rooms? Learn how to use portable K.I.S.S. Principle equipment for simple, economical, permanent solutions to your cooling challenges. Download

Cooling www.atlassales.com/literature/







1-800-454-5164

(800) 474-3947 www.lanstar.com sales@lanstar.com

Data Specialties Inc

Are you ready for the future? Let LANSTAR help you find out!

Need a data center makeover?

Build Data Centers

Facebook.com/DataSpecialtiesInc

Call LANSTAR for a **Data Center Health Review**

Need to review your remote access and KVM deployments?

Call LANSTAR for a **Data Center Health Review**

Do you want better power and energy management? Call LANSTAR for a **Data Center Health Review**

The LANSTAR Data Center Health Review is the best way for you to ensure your data center and everything in it is up to date and working efficiently. We've been serving the IT industry for 19 years.

> **Expand Upgrade** Trade-In

Give LANSTAR a call. We want to help you succeed!

Products and services include:

- SMB Server Room Solutions
- Infrastructure Access and Control
- Multivendor Server Management
- Power Management
- Energy Management Asset Management
- Technical & Systems Furniture
- Cable Management Flooring
- LAN Racks
- Asset Management
- Rackmount Enclosures



Prepare For The Unexpected With Room *Alert*

o one knows when or how disaster will strike. We just know the potential is always there. So preparation is crucial to minimizing its impact on computers, networks, users & business.

When disasters occur, there are significant costs in areas that go far beyond the simple replacement of damaged hardware. This is because what happens in the data center or other facility effects the entire organization. If disaster strikes your facility, how will it impact business? Who will get the blame? Could it have been prevented? What will it cost?



Room *Alert* products can monitor:

- Temperature Humidity
- Air Flow Sound, Light Heat Index
- Panic Buttons
- Switch Sensors · Room Entry, Motion

• IP Network Cameras • Wireless & More

AVTECH has a full line of powerful, scalable Room Alert solutions for real-time environment monitoring in a computer room, data center or other facility. All models arrive assembled with easy to install hardware, cables, sensors, easy-to-use logging & alerting software, printed documentation, unlimited technical support and a '30-Day Satisfaction Guarantee'. Users can typically install in under 10 minutes.

Room *Alert* products monitor critical environment conditions like temperature. power, humidity, flood, smoke, room entry, air flow, motion and more, alert staff by any method and can take automatic corrective action. There is a model that is right for any organization and budget... yours too!

Call or Visit Us Online Today



888.220.6700 • 401.628.1600 **AVTECH.com**

Protect Your IT Facility... *Don't Wait Until It's Too Late!*™

AVTECH is the worldwide leader of IT & facilities environment monitoring products, Purchase online at EnvironmentMonitor.com. Reseller inquiries welcome

KOLDLOK®

Features 22.55 square inches of usable cable area

Allows for large cable bundles or PDU plugs to be pulled through usable area

Split feature allows product installation without disturbing cables

Contains no loose or partially fastened parts

Impact resistant & durable

Extra sealing HBT Membrane Layer



6" Round Floor Grommet

TALK TO AN EXPERT TODAY!

About more Data Center Cooling & Containment Solutions



Internet Load Balancer up to 1.6 Gbps of Throughput Speed

Introducing the New Janus RX and TX Family of Load Balancers



Cell Janus RX Series

- 3, 4 or 5 WAN interfaces with 150, 300 or 600 Mbps of throughput
- Basic unit 3 WAN/150 Mbps upgrades to 4 or 5 WAN and 300 or 600 Mbps just by firmware upgrades
- Single hardware, 9 possible configura-



Cell Janus TX Series

- 5 or 8 WAN interfaces with 1.0 Gbps, 1.2 Gbps or 1.6 Gbps
- Basic TX-5 WAN speed is 1 Gbps Firmware upgrade to 1.2 and 1.6 Gbps
- Basic TX-8 WAN speed is 1.2 Gbps Firmware upgrade 1.6 Gbps

Main Features

- Designed to handle high volumes of internet traffic
- Balance of Outgoing Internet Traffic. Bandwidth Aggregation and Automatic Failover
- Balance of Incoming Internet Traffic. DNS server included to host domains (SOA)
- IPv4 and IPv6 supported
- All ports Ethernet Gigabit. TX-8 includes 4 SFP ports.
- Connect any type of modem/router: DSL, Cable, Fios, T1, etc
- Traffic patterns programmable committing specific traffic to specific lines (vpn on wan1, email on wan2 and wan3, rest of traffic balanced on all lines)
- Installable in transparent drop-in-mode in front of existing firewall or instalable as a standard firewall

Demo Units Available Upon Request!

Phone: (407) 574-2017 www.alvaco.com sales@alvaco.com



Dry Slide Rails

Why invest money on ball bearing slides & arms that you only use 10 times?

- Metal-to-metal friction slides
- Models for Dell, HP, Cisco, SuperMicro, IBM servers
- Custom versions available
- 4Post or 2Post mounting
- Square, round, threaded hole





design, build & ship

Need an answer now? 1-888-903-RACK

info@racksolutions.com

Inc. ©Copyright 2012 All Rights Reserved. All other marks of others are property of their respective owners.



Achieve Higher Densities

As densities rise, older cooling systems and airflow designs are struggling to keep up with cooling demand

Data centers require large amounts of cool air to maintain optimal temperatures. Cool air migration or leakage through cabling holes in data center floors can lead to a drastic inefficient use of cool air, allowing hot spots to develop and equipment to fail.



with removable brush and safety cover

Air-Guard Cable Seals eliminate nearly 100% of airflow bypass through raised floor cable cutouts

The Air-Guards Cable Seal family of grommets significantly minimize cool air loss, while improving the static pressure to cool data center equipment, which helps prevent expensive electrical equipment from overheating.

When it comes to sealing cable openings, Air-Guard has the product to meet your needs.

> Air-Guard Cable Seals are a simple inexpensive solution to promote more efficient cooling of your data center

Order TODAY! Visit our ONLINE STORE at

www.pducables.com

Call today 1.866.631.4238 for a FREE copy of the Air-Guard Brochure, or visit our web site at www.pducables.com



Toll-Free 1.866.631.4238 ♦ www.pducables.com



(888)-865-4639 www.lindy-usa.com

USB Port Blocker



System administrators can physically prevent users from connecting Pen Drives, MP3 Players and other USB Mass Storage Devices to their computers to copy data, introduce viruses, etc. The USB Port Blocker is a combined 'key' and 'lock' assembly which plugs into the USB port. Simply plug the 'keylock' into the port and release the latch - the lock remains in place! Plug the key back into the lock to remove. Easy!

- · Physically blocks access to a USB port
- Consists of 4 locks and 1 key
- 5 different color code versions available: Pink, Green, Blue, Orange, White



USB 2.0 Slimline Active Extension Cable

- 5 meter USB 2.0 Active Extension Repeater Cable
- Plug & Play -special software installation not required
- Compatible with both USB 2.0 and USB 1.1 devices
- Connectors: Type A USB Male to Type A USB Female
- For even greater distances simply connect up to 5 cables in series



FireWire Active Extension Cable

- FireWire Repeater Cable for extending the cable length between FireWire devices over distances greater than the IEEE 1394 specified limit of 4.5m
- Supports IEEE 1394 devices at speeds of up to 400Mbit/sec
- · Ideal for use with DV Camcorders, FireWire printers, scanners, digital cameras etc.



Wireless **VGA Compact Projector Server**

- · Allows connection to a projector or monitor via a wireless LAN
- · Wireless link coverage up to 100m
- · Ideal for use with PowerPoint and other presentation applications
- · Connects to the VGA port on your projector





WE BUY AND SELL



- GENERATORS
- AIR CONDITIONERS
- UPS SYSTEMS



- RAISED ACCESS FLOORING
- ▶ TRANSFORMERS
- SWITCHGEAR
- ▶ CHILLERS
- FIRE SUPPRESSION

FULL SERVICE DATA CENTER ASSET RECOVERY & DECOMMISSIONING





SPECIALIZING IN RESOURCE RECOVERY AND ASSET **MANAGEMENT SINCE 1993**



You Tube Linked in. 8+ 3





WWW.CRITICALPOWER.COM



Processor is produced by Sandhills Publishing.

Founded in 1978, Sandhills Publishing is an information processing company with a diverse range of products covering a variety of industries. Sandhills Publishing is located in Lincoln, the capital of Nebraska, and benefits from the quality of life and strong work ethic traditionally associated with the Midwest.



Attention Data Center Professionals

Where do you go to find the newest products available?

Check out each issue for . . .



Articles with valuable product overviews and data.

New Product articles filled with in-depth information.

FEATURED PRODUCT



A Comprehensive Metric

For IT Energy Efficiency



Stirling servers and Aber solutions. This means ever

will support the latest P trollers with a bus that

Aberdeen LLC Ups The Ante With 21 New Stirling & AberNAS Products Aimed At Companies Of

Aberdeen LLC once again stakes its claim to its position as a leading provider of the latest technologies to the IT community. Aimed at all IT users from the smallest businesses to multi-petabyte storage consumers, this newly released offering promises to deliver the most bang for the buck

can only get the most out of ser storage if they are ready for the ing technologies, which is whi ing technologies, which is added PCI Express 3.0

PHOTO LISTINGS includes brief overviews of data center products so use this section to get up to date with what's new on the market and to find products you need.

server vendors and SMASH extensions to network-based access protocols. It is designed to work with industry leading power distribution units from Server Technology and APC. Use its advanced auditing and loggling capabilities for regulatory compliance. Free up systems administrator time for planning and implementation. Use it in large data center racks, dark data centers, remote branch offices and closets.

(877) 912-3444 | www.digi.com

age solution. Additionally, the Z-Drive's level of concentrated ize, augment, and enrich your IT data to help you see your in-one systems covering log management for comp

📝 GREENSOL

GREENSQL ENTERPRISE EDITION

+972 (3) 688-8090 | www.greenSQL.com

Order online and receive free shipping when you

methodology, UL2640 gives hardware ven-dors an easy, universal way to publish accu-rate power consumption figures by providing equipment makers the PAR4 testing regimen as part of certification. With PAR4 included, Pfeiffer says, the "UL continuation"

"Given Moore's Law, IT equipment per-formance doubles every two years," Pfeiffer says. To simplify server comparisons, a Moore's Law-based PARF atting labels com-parative efficiency for each year, "past, pres-ent, and future," Pfeiffer says. This lets IT classify equipment based on "its energy effi-ciency relative to past and future equipment and in turn, they can then provision servers appropriately for compute needs today and plan accordingly into the future. They can also use it for an RO1 on early refresh, virtu-alization, or hardware upgrades in general."

PAR⁴ Measurement Service

surement (the high-

f but plugged in. the power cons

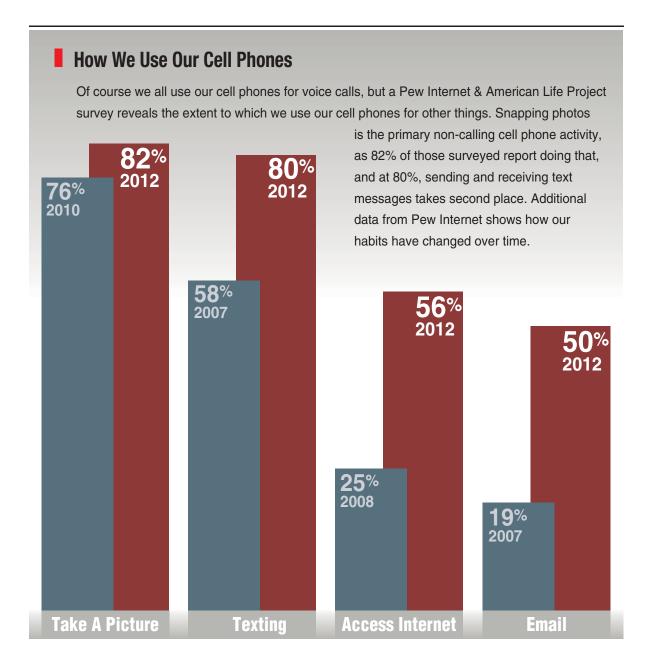
etter the energy efficiency) Gold, Silver, or Black; Measurements are col-To help with PAR4 testing, Power Assure provides a PAR4 Measurement Service that provides a PAR* Measurement Service that gathers measurements on equipment, pin-pointing exactly how much power a server uses. "This is measured data, not estimates," Pfeiffer says. "Power Assure technicians will perform all measurements at your location or our own laboratory using the Underwriters Laboratories tested PAR* methodology and equipment (UL2640 standard)." nt with power meters and note power consumption These include power on and a 100% load benchaded, and peak states of Pfeiffer says, includes:

Power Assure PAR4 ment running but not (888) 225-1575 A comprehensive metric for IT energy effici up, and that's the max ng normal operation." same as Loaded; in POWER ASSURE

< Quick rundowns of new data centerrelated products.

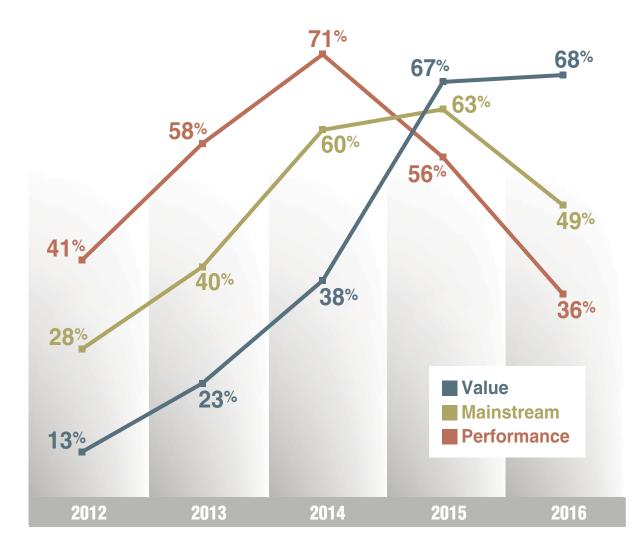
... then go to Processor.com and take advantage of our online search tools to find even more in-depth information!





Quad-Core Processors Becoming Mainstream

New data from IHS shows that while only 22% of notebook PCs included quad-core processors in 2012, 59% of notebooks shipped in 2016 will have quad-core processors. With smaller mobile devices, especially tablets, continuing to gain in popularity, IHS says that notebook manufacturers will have to increase the value of notebook PCs, and one way of doing that is to increase processing power. This chart illustrates IHS's forecast for the percentage of quad-core processors available in different types of computer notebooks.



Mobile Devices To Drive IT Spending

According to research firm IDC, global IT spending will pass \$2.1 trillion this year, which would represent a 5.7% increase over 2012 spending. IDC believes the 3rd Platform (IDC's term for a combination of mobile computing, cloud services, and social and big data technologies) will continue to be a major force, driving about 90% of IT market growth. IDC's recommendation for organizations is to get on board. "Companies that are not putting 80% or more of their competitive energy into this new market will be trapped in the legacy portion of the market, growing even slower than global GDP," says Frank Gens, senior vice president and chief analyst for IDC. IDC anticipates organizations will spend \$65 billion on "industry-specific solutions," with heavy emphasis on 3rd Platform technologies, this year, and that the figure will pass \$100 billion by 2016. According to IDC, mainframes and distributed computing are "1st Platform" and "2nd Platform" technologies, respectively.

Wireless LAN Now A \$1B-Per-Quarter Business

A consistently high-earning category for networking equipment manufacturers, wireless LAN hardware has become a \$1 billion-per-quarter business, according to Infonetics Research. "The usual demand drivers—wireless devices, BYOD, mobility—were in play, but there was also an acceleration of carrier Wi-Fi deployments, with sales of outdoor access points doubling over the past year," says Matthias Machowinski, directing analyst for enterprise networks and video with Infonetics. At this point the most recent wireless networking standard, 802.11n, has taken hold (Infonetics says 84% of access points shipped currently use 802.11n) and the next standard, 802.11ac, will begin to ship in the summer.

Researchers Forecast 1 Billion Mobile VolP Users By 2017

According to Juniper Research, there will be more than 1 billion mobile VoIP users worldwide by 2017. This category, referred to as OTT (over the top) VoIP, relies on mobile apps installed on smartphones and tablets to carry voice data between users via Wi-Fi; this leaves both Wi-Fi providers and cellular carriers out of the monetization loop with the exception of what carriers reap in data charges for non-unlimited plans. "Many subscribers sign up to an OTT service without ever planning to pay a cent for it, and some industry players do not have a short-term revenue model at all," says Anthony Cox, an associate analyst with Juniper. Cox expects increased availability of 4G network service will boost mobile VoIP usage while circuit-switched voice revenues will decline.

Study: Data Caps "Not A Necessity"

Over the past several years, new innovations such as rich content from VoIP and videoconferencing, high-quality video streams, and cloudbased computing have been possible, at least in part, because of a "relatively uncapped and unmetered Internet environment," according to a new report from the New America Foundation. But efforts by ISPs to eliminate unlimited data plans and instead place data caps on customers are "hardly a necessity," especially on wireline networks, the report states. "Although traffic on U.S. broadband networks is increasing at a steady rate, the costs to provide broadband service are also declining, including the cost of Internet connectivity or IP transit as well as equipment and other operational costs," according to New America Foundation. "The result is that broadband is an incredibly profitable business, particularly for cable ISPs."

IDC Increases Tablet Sales Forecast

Research firm IDC updated its expectations for 2012 worldwide tablet sales to reflect continued and enthusiastic interest in the computer platform, mainly among consumers. "Tablets continue to captivate consumers, and as the market shifts toward smaller, more mobile screen sizes and lower price points, we expect demand to accelerate in the fourth quarter and beyond," says Tom Mainelli, a research director with IDC.

In addition to raising its 2012 tablet sales forecast from 117.1 million to 122.3 million units, IDC raised its 2013 forecast from 165.9 million to 172.4 million units.

IDC Charts Disk Storage Capacity Growth

The latest "Worldwide Quarterly Disk Storage Systems Tracker" report from IDC, which examines disk storage capacity for Q3 2012, indicates 24.4% growth year-overyear with total disk storage capacity reaching 7.1 exabytes. The total disk storage market had about \$7.9 billion in revenues during the quarter, up 3.7% from a year ago. Within individual market

segments, revenue in the network attached storage area grew the most, up 5.7% from a year ago. Open networked disk storage revenues were up 4.7%, followed by storage area network revenues up 4.4% and external disk storage systems up 3.3%.

Tablet Adoption Spurs Supply Chain Adjustments

NPD DisplaySearch reports that continued tablet adoption is prompting display manufacturers

and OEMs to adjust their supply chain strategies. Manufacturers are facing year-to-year growth of just 2% for notebook computers while "mini-note PCs" fell 28% and tablets are zooming ahead at a 75% growth rate. "With 2013 business planning well underway, product portfolios, sales strategies, and sourcing plans for mobile PC brands will certainly impact the supply chain," says Jef

impact the supply chain," says Jeff Linn, value chain analyst for NPD DisplaySearch.

Semiconductor Revenues To Increase Despite Economic Worries

According to Gartner, worldwide semiconductor revenues won't be quite as high as predicted in the previous quarter due to fiscal cliff concerns in the United States, the European debt crisis, and a stalling memory market. The previously projected total was \$330 billion; Gartner has adjusted it down to \$311 billion. Still, Gartner expects 4.5% year-over-year growth in semiconductor revenues between 2012 and 2013. Gartner cites the continued popularity of tablet computers for both business and consumer markets as a growth contributor, even while Gartner reports a 2.5% reduction in PC production in 2012.

Gartner IdentifiesBYOD Security Considerations

Citing its own recent survey of organizations, in which 70% of respondents indicated they have or intend to implement a BYOD (bring your own device) policy, Gartner spelled out the major security concerns that companies should consider regarding BYOD. Among them is the risk of sensitive data leaving control of the organization as employees use mobile devices for both personal and work purposes; to remedy this, Gartner recommends MDM (mobile device management) software for policy enforcement as well as other solutions to control data traffic. Another concern involves privacy and perceived ownership of the contents of a device, which makes certain business-oriented security

solutions (such as remote wipe capabilities) tricky; therefore Gartner suggests companies work with their legal departments to review all solutions and their implications.

Cloud Computing To Influence Security Offerings

According to Gartner's December 2012 report on cloud computing, an uptake in cloud computing adoption among businesses will influence security vendors this year. Gartner says that

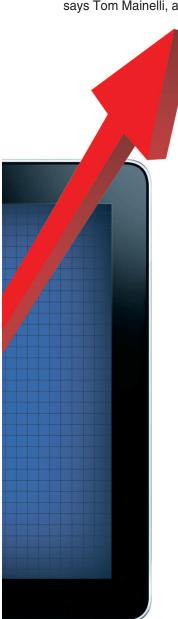
by 2015, 10% of enterprise security functions will reach organizations through the cloud, as security vendors will modify their offerings to match increased expectations for cloud-based solutions. And as more corporate networks are virtualized, there will be a similar transition, Gartner says, to vendors offering VPN and fire-

wall functions in the form of virtual switches as opposed to physical appliances.

China Taking Lead In Growth In R&D Spending

While the United States and Europe are plagued by massive debts and weak economies, China is taking a leadership role in spending on research and development, according to a report from independent research and development firm Battelle. Global spending on R&D is expected to grow 3.7% this year to \$1.5 trillion. The United States still maintains a healthy lead in R&D spending and is expected to spend \$424 billion this year, up 1.2% from 2012. But China's growth in spending will be up 11.6% to \$220 billion. "In a year of economic upheaval and turmoil, it's important to remember that R&D is not an instrument that can be quickly turned on and off to trigger economic growth," says Martin Grueber, a research leader at Battelle and the report's co-author. The R&D enterprise in the United States accounts for 8.3 million jobs, according to Battelle.





Plug The Holes In Cloud Computing

Tips For Choosing The Right Provider & Securing Your Cloud Implementations

THERE'S AMPLE RESEARCH pointing to the fact that more enterprises are turning to cloud computing solutions to satisfy various needs within their businesses, including needs that relate to data and applications. Enterprises that do seek out a cloud solution provider can typically realize any number of benefits, including possibly lowering their operating costs.

But with such rewards come security risks associated with cloud computing, including risks that can leave vulnerable the company's arguably most important asset, its data. The following advice aims to help identify common cloud-related security risks, how to address them, and more.

✔ Brief Yourself On The Common Concerns

Many of the security risks associated with cloud computing put data at harm.

"Cloud architecture enables applications to be processed on available servers/ virtual servers," says Joe Clabby, president of Clabby Analytics. "This means that applications travel through the amorphous cloud. So how do you keep track of who is authorized to access data? How do you authenticate? And how do you protect data on the fly through the cloud?" Another chief concern, he says, is that you can't track application behavior easily as it travels through the cloud.

Enterprise Strategy Group senior principal analyst Jon Oltsik says storing and processing sensitive data in the cloud is the most common cloud security issue he hears about. "In some instances, this isn't permitted due to government/industry regulations," he says. "In others, it's simply too risky." A related issue, he says, is where the data is hosted. "Enterprises

like to know where their workloads are physically located, but the cloud model is built around workload mobility. These two models are incompatible for security," he says.

Frost & Sullivan analyst Brendan Read cites "thicknesses of multitenant partitions," data breach attempts by thieves via the cloud/host provider, and client employeeaccessible data as common security issues enterprises are vulnerable to. Frost & Sullivan analyst Martha Vazquez, meanwhile, says the cloud's nature of making a third party responsible for company data is a common security concern. "Enterprises have that perception and fear of losing or not having control from any third-party data breaches that can occur," she says. Leading causes of security problems, she says, include data protection; data stolen from data centers; breaches; insider threats; lack of authorization, control, and visibility; and DDoS attacks.

✓ Create A Strong Security Foundation

To ward off potential cloud security problems, Oltsik recommends making a gradual transition to the cloud. "The first thing we tell customers is that they don't have to move highly secure applications and data to the cloud and that they should start with more pedestrian workloads," he says. If you're using a cloud solution that hosts sensitive data, he says, carefully assess the security controls the provider uses and ensure there are guarantees and penalties in the contracts. "There are secure cloud providers, but you have to pay extra for this," he says. Clabby advises that, beyond implementing security software, you should buy application performance management



software to track the path of applications through the cloud.

Frost & Sullivan's Read advises enterprises to insist that the cloud provider complies with such standards as PCI-DSS, SSAE 16 SOC, and ISO 27001. Conduct frequent post-audit drills, he says, train staff on signs of security issues, and mandate immediate reporting.

Where cloud security specifically relates to small to midsized enterprises, Read says that "cloud security is only as strong as the client side. SMEs may not be aware how vulnerable they are." Examples of possible vulnerabilities, he says, include "multiple uncontrolled data access points, Web access, absence of software downloading policies, and lack of employee awareness and training."

Encryption and managing encryption keys is another concern, Vazquez says.

"Concerns are around the data in motion, in the cloud, and at rest at the data center," she says. It's very important to ensure that data being sent to and stored with the cloud provider is encrypted and protected.

✓ Get Proactive

In addition to buying systems that are certified as secure, Clabby says, he advises buying good authentication and authorization software, looking "for a comprehensive, integrated portfolio from your vendor." Oltsik says there are newer options available for enterprises to add their own security to cloud workloads. Typically, Oltsik says, "you want your cloud provider to share security information with you in some type of automated fashion so you can monitor in-house and cloud-based security in one place. In lieu of this, you want access to

events, logs, configuration data, patching schedules, etc."

Vazquez says to make certain that correct policies are in place so only authorized users (inside and outside employees or partners) have access to the authorized tools they need. Security solutions that a company can consider implementing into its own network, she says, include anti-DDoS solutions from service providers, encryption, intrusion detection and prevention systems, and proper security at the endpoint. "Organizations need to make sure cloud providers implement best practices and provide them with visibility and with the upmost security compliance posture," she says.

Overall, Read says, small to midsized enterprises may ultimately be better off with their applications in the cloud because "they can avail themselves of strong, effective, and compliant processes and well-trained personnel that they could not have otherwise afforded."

✓ Look For Solid Providers

When sizing up a cloud provider's security prowess, Oltsik says to ensure it operates a SAS-70-compliant data center, runs background checks on all employees, and implements role-based access control to hide data from systems administrators. In addition, be sure to request a full description of all security processes, staff skills, and technologies and demand the right to audit the provider's security at any time. "The cloud providers get it," he says. "Federal agencies can also buy FISMA-compliant cloud services. I expect more hybrid controls in the future that can secure IT at the customer premises and also have visibility into the cloud."

Bonus Tips:

✓ Keep Contracts In Mind

Enterprise Strategy Group senior principal analyst Jon Oltsik says that, although there are cloud-related security problems specific to small to midsized enterprises, he doesn't believe they are too different from issues large enterprises face. An exception may be contract negotiations. "Large enterprises have more skills and resources here," he says, while smaller enterprises "may not be able to determine what they need covered in a contract and may miss important security protection or liabilities."

✓ Check The References

Joe Clabby, president of Clabby Analytics, defines a cloud provider as either providing hosted cloud services or helping an enterprise build its own cloud. "In each case, demand references" when choosing a provider to work with, he says.

✓ Use Consistent Security Policies

As cloud usage becomes more common, says Frost & Sullivan analyst Brendan Read, "expect thieves to step up their targeting of cloud providers." Frost & Sullivan analyst Martha Vazquez agrees, adding that "attacks are likely to be looked at from each layer; hence, it's important that security policies are consistent and secure at each layer."

✓ Watch For Leading Causes Of Security Issues

Enterprise Strategy Group senior principal analyst Jon Oltsik says leading causes of cloud-related security problems involve lack of judgment or neglect, in which "either someone moves sensitive data to a cloud provider that isn't built for security, someone doesn't take the time to properly assess a cloud provider's security, or someone doesn't add the proper security controls to cloud-based workloads."

Eliminate Network Data Bandwidth Hogs

View & Control How Users & Applications Are Using Your Network

EVEN IF YOUR ENTERPRISE HAS adequate bandwidth to satisfy employee and customer needs, it's important that network administrators have the ability to monitor how employees, customers, and various applications are using that bandwidth in order to monitor and set thresholds on usage should the need arise. The following tips can help in recognizing network bandwidth hogs and controlling their bandwidth habits.

Measure To Effectively Manage

Bob Laliberte, Enterprise Strategy Group senior analyst, says to "effectively manage something, you need to measure it." In terms of network bandwidth, without visibility it's not only impossible to manage it, "worse, when there is a problem, you may not know what caused it, and it will take much longer to shut down," he says. Acquiring a tool or solution that provides requisite insight into the network, he says, is the first step toward enabling administrators to be able to decide necessary actions possibly required such as QoS or blocking access to sites or certain employees.

More enterprises are keeping business-related network services available 24/7 for customers, employees, and remote offices, say Manny Alvarez, general manager at Alvaco Networks (407/574-2017; www alvaco.com), and Clarence Ki, director of software engineering at Cell Technology (www.cell-technology.net). And, on top of that, enterprises are seeking minimum network connection costs and resources to maintain network availability without WAN link outages. "Therefore, the type of bandwidth usage and how to manage this bandwidth effectively is critical," Alvarez says.

✓ Inform Yourself

A lack of insight into network bandwidth usage leaves enterprises without information regarding legitimate vs. illegitimate bandwidth usage. Alvarez and Ki advise monitoring bandwidth usage during peak and off-peak hours, something that will provide important data for network planning and service allocation. Acquiring data related to traffic flow will help identify heavy network bandwidth users so administrators can enforce management actions. Data gathered through packet inspection will help in detecting possible intruders inside and outside the network, Alvarez and Ki say. "By collecting that packet information, a security advisor is able to provide recommendations to the SME to reduce or prevent the possibility of data leakage and DDoS," Alvarez says.

Laliberte says IT organizations of all sizes are being inundated with smartphones and tablets due to the popularity of such devices and the related consumerization of IT. As employees use the corporate WLAN, he says, "organizations should be cognizant of what they're accessing." Although mobile devices can be "great productivity-enhancing tools," he says, "they can also be used to update Facebook statuses and/or play online games. So having visibility will be important to better manage this access."

✓ Prioritize, Stabilize & Optimize

Prioritizing network traffic/services into different classes, Alvarez and Ki say, is essential. "Higher priority traffic, such as VoIP and videoconference, can be guaranteed to be delivered with low latency and high quality," Alvarez says. "Low-priority



traffic, such as Web surfing and email, can be allocated with lower delivery priority. SMEs can maintain the bandwidth usage more efficiently and effectively inside the network by managing the QoS."

Alvarez and Ki also recommend providing stable and reliable content. "In some cases, SMEs deliver content through their internal Web service or media server. By knowing the bandwidth usage of the SME's network, they can plan a proper network bandwidth to maintain the high quality of content delivery service to their customers," Alvarez says.

Depending on bandwidth usage and traffic behavior, Alvarez and Ki say, enterprises may be able to select a more suitable network service package from different ISPs. If Internet traffic is a bandwidth-demanding application, for example, a company can obtain less expensive

services (ADSL or cable, for example) to provide higher bandwidth with perhaps lower stability Internet service, Alvarez and Ki say. If the majority of traffic is a time-critical or real-time application, companies can acquire higher stability, low-latency service such as fiber, MPLS, VPN, or leased line.

"Both of those network services can also coexist in the SME network for all applications to be delivered by connecting an Internet load balancer to all service providers," Alvarez says. "The SME can optimize its cost to manage different traffic into different service providers."

✓ Implement A Solution

Deciding what bandwidth thresholds are appropriate to enact is up to individual organizations, Laliberte says, but factors may include how much bandwidth overall is available and how much is needed for critical apps.

"Ideally, policies would be put in place to ensure all mission-critical apps and processes get the bandwidth that's required, then what is left over can be used for other purposes," he says. Policies might allow the marketing department access to social networks to run campaigns but restrict access to those sites for other departments. "In universities that I have talked to, bandwidth during the day is allocated between faculty and students, but at night more bandwidth is shifted back to the students," he says.

Laliberte says available solutions include those that can determine the traffic coming and going and that can "help establish QoS down to an individual device," he says. In addition, organizations can use firewalls to determine "top talkers," which is a "more manual process," Laliberte says.

Alvarez and Ki say determining which thresholds to set depends on if there's a service charge in place for bandwidth and for critical or non-critical applications. Bandwidth or traffic monitoring, however, is the "first step to determine the control of bandwidth," Alvarez says.

Available solutions for controlling bandwidth usage, Alvarez and Ki say, include deploying security equipment such as a firewall, IDS, IPS, or UTM. Specifically, a firewall can block unwanted access between the Internet, DMZ, and intranet, Alvarez says, while an IDS/IPS/UTM device can detect and block possible attacks, intrusions, viruses, and data leakages. Overall, "bandwidth management equipment can limit and manage the activity of heavy users and prevent DoS/DDoS attacks," Alvarez says.

✓ Enlist Bandwidth Management, Load Balancing

Manny Alvarez, general manager at Alvaco Networks (407/574-2017; www.alvaco.com), says enlisting bandwidth management and load balancing equipment are two measures related to bandwidth usage that are easy to implement. Bandwidth management equipment, he says, can efficiently manage and control usage, applications, and time-critical traffic. Load balancing equipment can help plan and allocate various bandwidth/traffic or applications in the network with "aggregate multiples of broadband network access."

✓ Beware Of Obstacles

Manny Alvarez, general manager at Alvaco Networks (407/574-2017; www.alvaco.com), cites network design and technical support resources as two obstacles enterprises will likely encounter in identifying heavy bandwidth users. "SMEs should plan a good network design, including network equipment monitoring and management, as well as control bandwidth usage," he says. "Technical resources and engineers are also important for identifying and analyzing network data. In-house network engineers (IT managers) or a subcontractor should be in charge of these tasks."

BONUS TIPS:

✓ Go With The Flow

One tool for monitoring network traffic is using a flow monitoring technology such as sFlow, say Manny Alvarez, general manager at Alvaco Networks (407/574-2017; www .alvaco.com), and Clarence Ki, director of software engineering at Cell Technology (www.cell-technology.net). Described as an industry standard, sFlow monitors highspeed switched networks and "gives complete visibility into the use of networks" to enable "performance optimization, accounting/billing for usage, and defense security threats." Alvarez says, "This kind of traffic flow tool provides some statistics about the bandwidth usage of users and applications inside a network."

✓ Educate The Masses

One easy way to control bandwidth usage, says Enterprise Strategy Group senior analyst Bob Laliberte, is educating employees on bandwidth-related policies and why they're important to follow. For example, education can include detailing the business impact of a critical app going down "because too many people are watching Netflix at lunch," he says.

How Are You Using Water In Your Data Center?

Metric From The Green Grid Helps To Improve Your Water Efficiency

WATER USAGE EFFECTIVENESS, or WUE, is a relatively new metric developed by The Green Grid, a non-profit organization consisting of more than 175 companies with the ultimate goal of helping companies be as efficient and environmentally responsible as possible.

The worst enemy of your overall WUE? Inefficiently using water to power and/or cool your data center. The many members of The Green Grid have come together to help data center managers figure out ways to monitor their data center water usage, take measures to improve the efficiency and effectiveness of water usage, and improve their WUE to save money and help the environment.

✓ Why Worry About Water Usage?

It may seem more important to focus on energy usage and the power consumption of data center equipment than to worry about how water is being used, but water can be a wasted resource just as much as electricity. Energy efficiency is important, and lowering power consumption is a great way to cut down on costs and help the environment at the same time, but it's only one part of the puzzle. The Green Grid created the WUE metric, as well as others, to bring awareness to widespread resource inefficiency in the data center world.

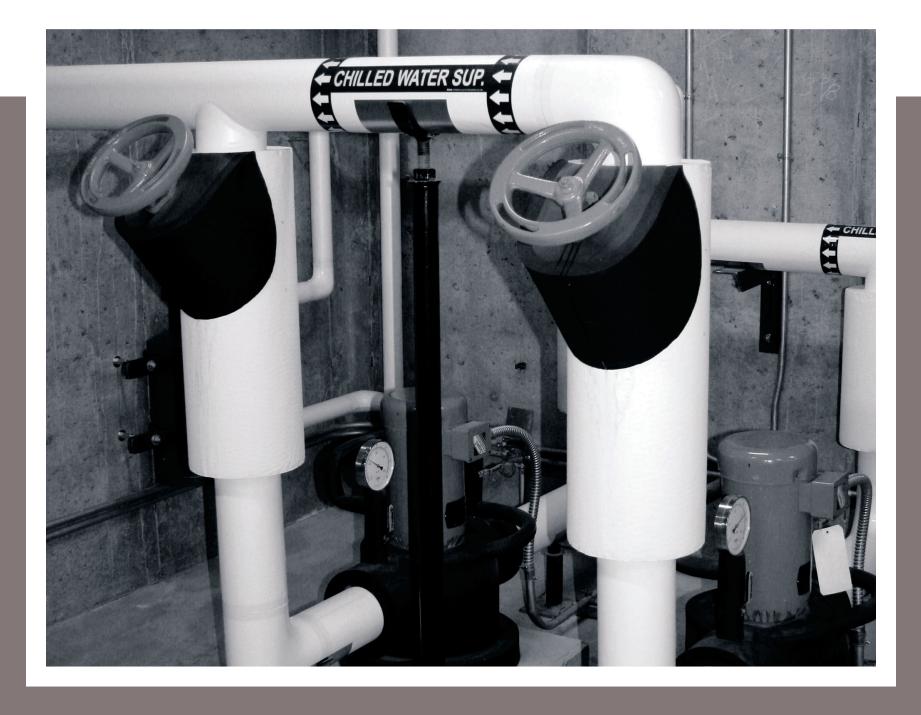
"Energy is one aspect of a resource used in the operation of a data center, water certainly is a resource that's used significantly," says John Tuccillo, president and chairman of The Green Grid. "The Green Grid extended its mission beyond energy efficiencies to resource efficiencies out of consideration of the other resources that are employed to have a successful, efficient, environmentally sustainable architecture for a data center."

Understand The Metric & Start Monitoring It

WUE consists of two different metrics, which are outlined in White Paper #35, edited by Michael Patterson, The Green Grid's

technology and strategy work group chair. To find your WUE, take your annual site water usage and divide it by the IT equipment energy used. The WUEsource metric adds the offsite water used to produce energy in your data center to the onsite water usage and then divides it by the IT equipment energy used by your infrastructure. WUE is great for figuring out how well you use water onpremises, while WUEsource takes an extra step and provides detail for outside water energy sources as well. (See the "Understand IT Equipment Energy & Annual Water Usage" sidebar for the equations.)

To get the full effect of the WUE metric, you have to start metering it. And by monitoring your data center's WUE, you



will immediately spot potential changes. "If you're in a data center that has gone to a heavily virtualized architecture, you may have your processors on a particular board running at peak or 80% utilized as opposed to another bank of servers that's throttled back and at idle," Tuccillo says. "You're certainly not going to want to provision 100% of the water to both of those rows. What you're going to want to do is provision it to where it's needed. You need the visibility and management over it."

✓ Improve Energy Efficiency

It may sound contradictory, but the best and possibly easiest way to improve your data center's WUE is to improve your energy efficiency across the board. Tuccillo says that it's important to create a balance between your different cooling techniques. For instance, if you only use water-based cooling techniques, then the air temperature in your data center may rise due to lack of fans. This can cause air conditioning units to be overworked. But if you can balance fan-based cooling, decrease the air temperature in the data center as a whole (possibly through free air cooling), and use less water, then you've found a balance that will positively impact your WUE.

✓ Create Balance In Your Data Center

There are many ways to both positively and negatively impact the WUE level

of your data center. Some of these tactics only require you to tweak your existing systems to make sure that you are using water cooling, physical cooling equipment, and free air cooling in harmony to make sure you aren't unduly taxing one system over another. However, Tuccillo points out that some companies are taking WUE to a whole new level by making it a larger focal point of their operations in an attempt to cool more efficiently and help ease the burden on the environment. For example, one company brings contaminated water in, cleans it, and uses it for cleaning. Then, as the water is discharged, it is actually cleaner than the water that was taken in and is discharged at the same temperature as the inlet, Tuccillo says.

And the interesting ideas for water cooling techniques don't stop there. "There is some really great, innovative work emerging around the globe where data centers are going waterless, some are going with just site water sources, and some are using deeply chilled glacier water," Tuccillo says. "You really need to strike balance between what's right for you at a given time as a part of your overall business model and in consideration of the environmental sustainability attributes of your company in your location. It's going to be different based on where you are and what you're trying to do."

✓ Go Beyond Water

The Green Grid has developed many other metrics that companies can use to improve their data center efficiency, including PUE (power usage effectiveness), CUE (carbon usage effectiveness), and ERE (energy reuse effectiveness). "We're recognizing that not one metric is going to solve the whole problem," says John Tuccillo, president and chairman of The Green Grid. "It's a very complex environment, but by having an agreed-upon methodology to quantify those different conditions, it allows the data center owner/operator to strike the most optimized balance so that you're as energy effective as you can be."

✓ Understand IT Equipment Energy & Annual Water Usage

Along with illustrating the actual equations for figuring out your data center's WUE, The Green Grid's White Paper #35 also outlines the components of IT equipment energy and your annual water usage numbers. Your IT equipment energy number includes compute, storage, and networking equipment, as well as supplemental equipment, such as switches, monitors, and workstations/laptops. Annual water usage encompasses several elements, including humidification and water consumed for cooling the data center or data center-associated equipment. The more accurate you can be with your equipment energy and water usage measurements, the more accurate your WUE reading will be.

 $WUE = \frac{Annual Site Water Usage}{IT Equipment Energy}$

 $WUE_{source} = \frac{Annual Source Energy \ Water \ Usage + Annual Site \ Water \ Usage}{IT \ Equipment \ Energy}$

BONUS TIPS:

✓ Raise Your Operating Temperature

As with any cooling technique, you can improve your cooling WUE by raising the operating temperature of your equipment, based on ASHRAE recommended limits. The Green Grid's White Paper #35 points out that doing so will "allow warmer chilled water and require less evaporation of water to produce it."

✓ Location, Location, Location

The location of your data center can have a larger impact on your WUE than you may think. If you are planning to build a new data center, look for locations with cooler overall climates that provide the opportunity for free air or natural cold water cooling. This can improve your WUE and help minimize power consumption.

Repair Equipment

Tips To Pick A Provider & Ensure Fast Fixes

EQUIPMENT IS BOUND to break down at some point—it's a virtual certainty in the data center world. It could be something as inconvenient as a printer going down or something as complicated as losing an entire server. For this reason, it's important to have a hardware repair vendor ready to go that will provide the best possible service in a timely manner.

Here are tips designed to help you know what to look for in a hardware repair company and make sure the repair goes as smoothly as possible.

Decide Whether It's Better To Repair Or Replace

In some situations, there is no quick fix for a piece of equipment, and your only

real option is to consider purchasing new. Although equipment life expectancies can vary greatly depending on the device in need of repair, experts say that the decision on whether to repair or replace equipment relates directly to the age of the equipment and how important it is to system uptime.

Jesse Simpson, director of technical services at Pegasus Computer Marketing (800/856-2111; www.pegasuscomputer .net), says that the best time to replace equipment is "when the cost to maintain the old is equal to or beyond the cost of new." But he also adds that for some companies, it's time to consider buying new equipment when the old cost to maintain is 60% of what new would be.

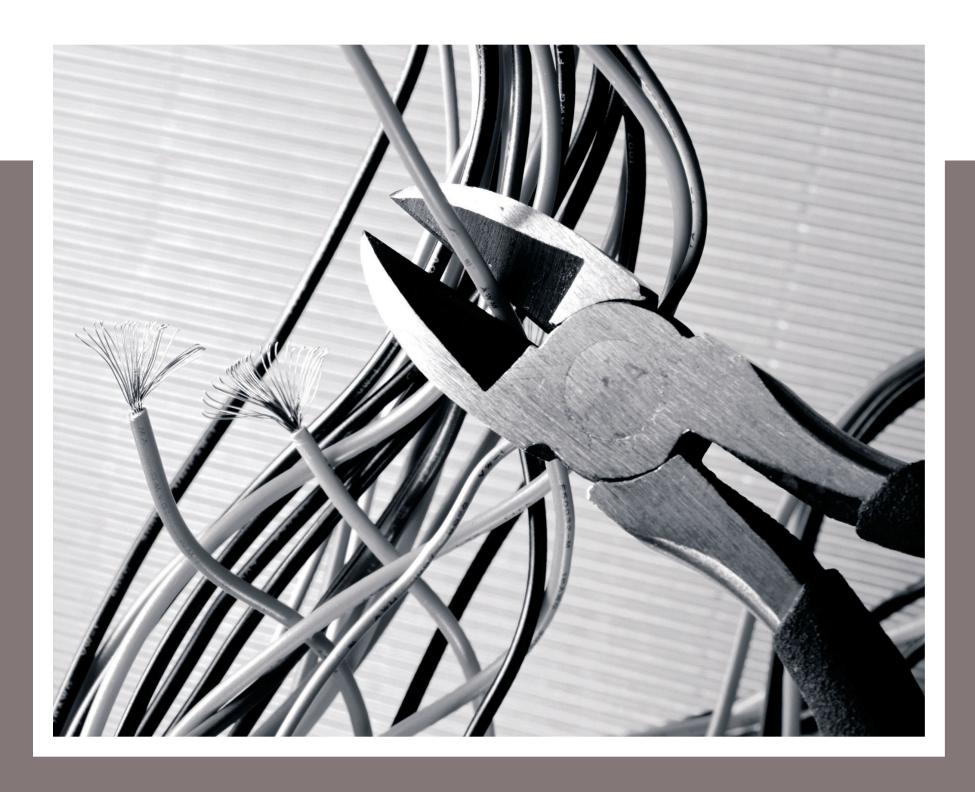
For companies that are looking to save money on equipment purchases, Simpson says refurbished can be a good alternative with the correct warranty provided as well as a clear understanding of what the warranty would cover compared to a new unit.

Another clear indicator that it may be time to invest in a new or refurbished solution is when a piece of equipment is being repaired for the same issue over and over again. If you're sending in damaged equipment every few months or so, the costs of those repairs will start to add up over time. It may only be a matter of time before that piece of equipment fails completely, forcing you to scramble to buy a replacement and avoid potential downtime.

✓ Is The Equipment Under Warranty?

Most high-end IT equipment vendors provide a minimum warranty period. The length of time typically varies by the type of hardware. New desktop machines usually come with a one-year warranty, while an LCD monitor might be good for up to three years. Warranty repair usually involves sending the device back to the vendor, meaning you'll need some type of spare if it's a critical item.

Keeping track of equipment and warranty periods could become a monumental task for a medium-sized enterprise. That's where choosing a preferred vendor for a specific type of equipment



comes in handy. Most of the desktop PC vendors track equipment by serial number and can quickly tell you whether an item is under warranty.

✓ When In Doubt, Call Your Repair Vendor

If you think a piece of equipment may be malfunctioning and in need of repair, it's a good idea to get in contact with a vendor and speak to him about the issue.

For example, "many times a PoS unit may show symptoms of hardware failure, and even though many companies have their own IT group, the group is more software-oriented vs. hardware troubleshooting-oriented," Simpson says. "I'm not saying many IT people

cannot diagnose it, but most don't have time. In many cases, it may just require a simple phone call to third-party repair facility to do a repair over the phone that prevents the user from having to send in a piece of equipment."

Calling your hardware repair vendor first could end up saving you quite a bit of money if a simple over-the-phone repair is enough to get the job done. However, in some situations, you'll need to go a little further and request either an on-premises repair or send your equipment to the facility itself.

Although it may be tempting to try to repair equipment yourself, it's important to know your limits and capabilities. "What we consider simple may be considered complex or too risky to allow an employee to handle or even a manager with limited mechanical skills to attempt," Simpson says. "The cost to replace or end up having to send to a third party for a flat-rate repair is just too high to allow that," he says. With PoS equipment, for example, "most repairs, outside of just replacing batteries for mobile units and damaged cable assemblies or removing debris from printer paper paths and keyboards on PoS units, are about as deep as most companies will allow an employee to operate."

✓ In-House Or Outsource ?

Keeping employees with experience maintaining a wide range of equipment

can get expensive. Some companies are turning to keeping a small computer repair team and then looking to outside sources for everything else. Most all channel partners for large vendors have factory-trained technicians to handle everything they sell. If you buy equipment from a distributor, you'll probably find it services what it sells as well

Upgrading the skills of current employees is another option. While factory training can be expensive, it could save you money in the end. Other training opportunities exist from third parties. You can also offer an increase in pay or bonuses to those who get additional certifications on their own.

✓ What To Do With Network Equipment

Data center managers should take a long, hard look at the core layer for equipment repairs. This includes Fibre Channel switches at the data center's main points of ingress and egress access. If a failure exists at this level, it is wiser to consider a repair because the data center greatly depends on these switches, a failure is much more catastrophic to the business, and the failure rate is so low that repaired units can last for years. Conversely, the access layer—the switches closer to the end users—should be considered a prime candidate for replacement because there is more equipment at this layer, and replacing these switches and equipment won't have a detrimental effect on the business.

When looking for a vendor to help with repairs to the network, look for one that can offer a hot-swap for failed equipment. For example, for a failed switch, you could first request a replacement unit, then send in the failed unit for repair.

✓ Communicate & Ask Questions

You need to be in constant communication with your hardware repair vendor to ensure you are getting exactly what you're paying for. Good communication is often the sign of a reputable repair company.

"One of the hardest parts is to not know what is going on with your equipment or not being able to reach a real person when you have an emergency or need a quick answer," says Jesse Simpson, director of technical services at Pegasus Computer Marketing (800/856-2111; www.pegasuscomputer.net). "Don't be afraid to ask questions. If you ask enough questions and just do not get the answers you expect or no answer at all, run. We all make mistakes, sometimes answers are not just cut and dry, but you should know you're in safe hands and know you can trust them."

BONUS TIPS:

✓ Be Ready For An On-Premises Repair

If you've selected a hardware repair vendor and decided that an on-premises repair is necessary, there are a few ways you can prepare for the incoming repair specialist that should help the repair process go quickly and smoothly. Make sure that you have a backup piece of equipment in place. Backup solutions can help you avoid additional repairs and cut down on costs. It's also important to separate the damaged component from other working components to ensure no additional damage is done.

✓ Compare Vendor Services & Reputation

Before you sign a contract or send off your equipment for repair, you should evaluate several repair vendors to make the best possible choice. The only way to get the best service and price is to compare as many different repair vendors as you can. Not all hardware repair shops offer the same services, and some might not even provide those services for your specific region. You should go beyond what types of repairs they are able to perform and focus on vendor reliability, stability, and longevity.

Cooling Tips For Winter Months

Don't Let The Dropping Temperatures Leave You Unprepared

COOLING YOUR DATA CENTER and maintaining the proper operating temperatures for equipment is crucial to making sure your facility is as efficient as possible. And while companies are looking to improve cooling efficiency at all times, the winter season brings both advantages and disadvantages. We'll show you how to take advantage of the naturally lower temperatures during the winter months and help you avoid problems associated with those same colder conditions.

✓ Take Advantage Of Free Air Cooling

Free air cooling is an exceedingly popular approach for data centers located in regions with regularly cooler temperatures or with

longer fall and winter seasons. By simply pulling in the naturally cooler air from outside into the data center, you can lower the ambient temperature of your server room and help raise the efficiency of your cooling systems. And if you are able to introduce equipment that can run at higher overall operating temperatures as well as improve the overall airflow management of your data center (including inside racks, between racks, above the ceiling, and below the floor), you'll receive even more benefit from free air cooling techniques.

"With airflow management fundamentals effectively implemented, the maximum IT equipment intake temperature will drop by 10 to 15 degrees Fahrenheit," says Lars Strong, senior engineer at Upsite

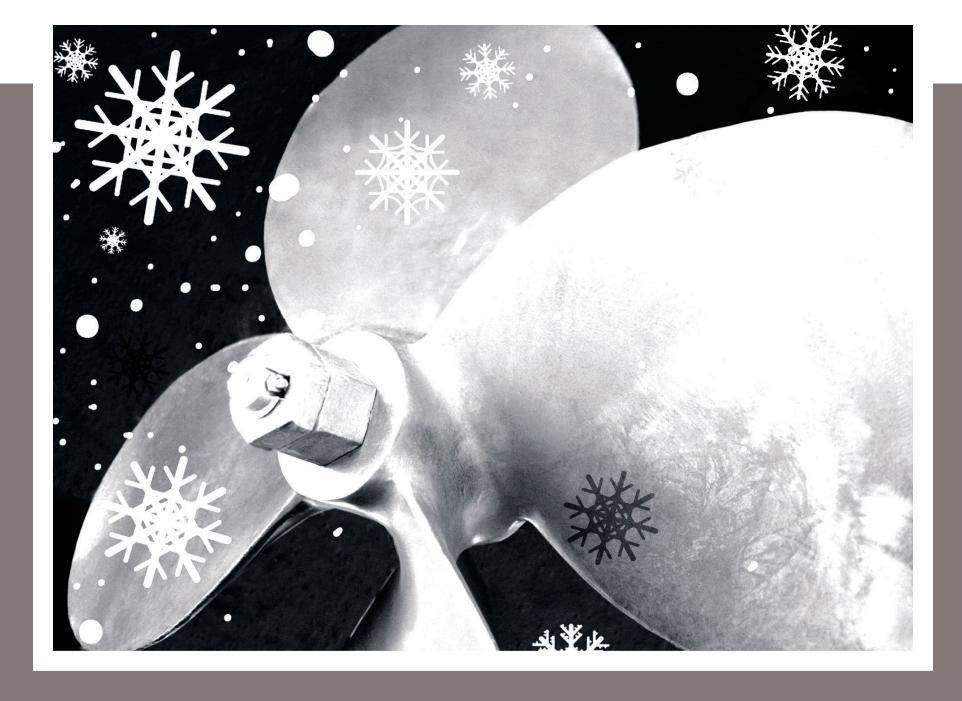
Technologies (888/982-7800; www.upsite .com). "This means the cooling unit set points and resulting supply air temperatures can be raised by 10 to 15 degrees Fahrenheit. As a result, free cooling infrastructure must be able to meet a supply air temperature of 69 degrees Fahrenheit. The number of hours annually that this requirement can be met is dramatically higher than meeting a requirement of 54 degrees, which dramatically improves the return on investment of free cooling implementation."

✓ Be Aware Of The Disadvantages To Free Cooling

Even though free air cooling and other similar solutions may be attractive, it's important to consider the potential

downsides of these techniques, depending on your data center's location in respect to outside hazards.

"While it's certainly true that cooling a data center in winter requires less energy than in summer, free cooling has potential risks as well as rewards," says Dave Ruede, vice president of marketing at Temperature@lert (866/524-3540; www.temperaturealert.com). "If direct free cooling is used, particle loading from heating systems and automobile exhaust is a risk. Additionally, airside economizers have the potential to add corrosive gases, such as the sulfur dioxide from automobile exhausts or hydrogen sulfide from power plants, to the data center incoming air."



Because of this, Ruede recommends that companies look at indirect cooling economizers, including water-based systems. But he warns that such systems will "add to the facility's maintenance regimen." Ruede also points out that some vendors offer specialized filters that can remove corrosive gases and prevent them from entering the facility. But as with any implementation, he says, you'll need to weigh the lifetime and replacement costs against the potential energy savings.

Consider Portable Air Conditioning

If you are using more outside cooling than you normally would during other

seasons, you may not need to rely on your primary cooling systems. Instead, you may want to consider simply adding portable spot coolers to your data center floor, which can help circulate the already cool air and ease the burden on power-consuming stationary HVAC systems.

"Most systems will work best if kept simple rather than complex, which applies to the cooling of data centers and server rooms," says Clark Michel, vice president of Atlas Sales & Rentals (800/972-6600; www.atlassales.com). "Though a range of specialized installed equipment is available for these applications (including precision cooling and split systems), portable air conditioners can often provide simple and flexible

solutions at a fraction of the cost of permanent equipment."

Think Ahead For Potential Backup Failures

If natural disasters have taught data centers anything, it's the importance of having backup power systems in place to ensure facilities are up and running even during the worst of times. And although companies can't be prepared for everything that gets thrown their way, that doesn't mean that preventive planning should be thrown to the wayside. Testing and maintaining backup power solutions is just as important during the winter as it is during any other time and if your power fails, so do your cooling systems.

"If a medium to large high-reliability facility loses power, UPSes and backup generators are the first line of defense," Ruede says. "Making sure backup equipment is operating well with regularly scheduled testing is mandatory, and consider potential failure modes not originally imagined such as, 'Is the diesel in my emergency generators too old to work properly?', or 'Is the diesel fuel in my outdoor storage tanks rated for sub-freezing temperatures?' We read stories of people carrying diesel fuel up stairways because flooding took out fuel pumps during [hurricane] Sandy. IT professionals would do well to consider such what-if scenarios for their own sites."

✓ Be Aware Of Supplemental Cooling Loss

In the summer, most companies are running air conditioning units to cool workplaces in addition to cooling solutions used in server rooms and data centers. But in the winter-time, companies will trade air conditioning for heating. However, this can lead to issues in the data center where temperatures must be maintained at a certain level and force you to add more cooling where it wasn't previously required.

"It is important to keep data center and server room temperatures at 68 to 72 degrees Fahrenheit and relative humidity between 40 and 55% year-round to prevent failure and maximize the life of IT equipment," says Clark Michel, vice president of Atlas Sales & Rentals (800/972-6600; www.atlassales.com). "Winter carries special challenges for data centers. When buildings switch over from central air conditioning to heating, it's important to re-evaluate cooling requirements now that supplemental air conditioning from the building is no longer available."

✓ Monitor Humidity, Even In The Winter

While excess humidity is a problem in the summer, a lack of humidity during the winter months can also cause problems for data centers. As such, it needs to be monitored at all times. "In very cold climates, winter is not only a time to monitor temperature but also relative humidity," says Dave Ruede, vice president of marketing at Temperature @ lert (866/524-3540; www.temperaturealert.com). "Static electricity build-up is a greater risk in the low humidity of winter, and the risk of electrostatic discharge (ESD) to sensitive microelectronics is greater. Maintaining relative humidity at safe levels, such as the ASHRAE TC 9.9 guidelines suggest, can help ensure ESD events do not impact data center operation."

BONUS TIPS:

✓ Monitor All Year Round

Even if you implement free air cooling techniques or take advantage of lower temperatures in other ways, that doesn't mean you can sit back and stop being vigilant. "It is just as important to monitor temperatures in the winter as it is in the summer," says Lars Strong, senior engineer at Upsite Technologies (888/982-7800; www.upsite.com). "Seasonal changes in most climates have a relatively small effect on the load placed on computer room cooling infrastructure."

✓ Check The Status Of Cooling Towers

Depending on your geographic region, Strong says that cooling towers can be affected by seasonal changes, especially during the blistery conditions of winter. "An exposure unique to winter is the potential of cooling towers to form ice," Strong says. And if you allow the ice to build up for too long, it can reduce airflow or even prevent fan rotation, he says, which could lead to overheating and other issues inside the data center.

HOW TO

Develop A Plan For Power Emergencies

Ensure Your Operations Keep Running Following A Power Outage

EMERGENCIES WILL HAPPEN. What's important is being prepared for when they do. Nowhere is this more evident than when dealing with power-related emergencies. With a company's livelihood literally at stake when power is cut off, IT and data center managers must have processes, systems, and resources in place to enable them to act immediately. The following offers advice for preparing for and dealing with power-related emergencies.

Make An Honest Assessment

Knowing what weaknesses exist requires taking a long, hard look inward. Rachel Dines, senior analyst at Forrester, says many organizations are overconfident in their preparedness for power outages or shortages because they don't test their

emergency plans often enough and they assume outages occur infrequently and don't last long. The United States' aging power infrastructure, however, requires being prepared for unexpected power outages, she says.

The average small to midsized enterprise is "very poorly" prepared to deal with various emergency power situations, says Quocirca service director Clive Longbottom. Although most SMEs are best prepared in terms of small UPSes, he says, many are overloaded with too many devices, meaning they'll "only provide minimal support on a power feed disruption," he says. Few SMEs are prepared in terms of auxiliary power generation, he says, because it's often seen as overkill, but "with IT being

so important these days, that isn't necessarily the case," he says.

"The main perception of power to the data center tends to be that it's either there or isn't, and if it's not, the plan just has to be to bridge to when it's back again," Longbottom says. Although some outages can last only seconds to minutes, those due to weather (lightning and floods, for example) or an "act of idiocy" (a backhoe cutting a cable) can last hours to weeks. Developing a plan to cover every possibility is incredibly expensive and beyond what SMEs can generally afford, he says. Thus, having a full business continuity plan is vital. "If the power is going to be down for a considerable period of time, will it be possible to set up a working environment elsewhere, such as through a hosting company, in a quick

Key Points

- Power outages can happen because of failures with a grid power feed, voltage fluctuations, and natural causes; enterprises should be prepared for short- and long-term outages.
- Many small to midsized enterprises fail to test their emergency plans regularly because they assume outages only occur infrequently and last briefly.
- It's important to have someone responsible for maintaining and testing the various components of the emergency power system.

enough time to stop the organization going out of business?," he says.



What To Prepare For

Power outages can occur for numerous reasons, including failures with the grid power feed; unpredictable voltage fluctuations such as sags, surges, and spikes; and larger events such as winter storms, hurricanes, and blizzards. "Firms need to be prepared for both short-term and long-term outages," Dines says.

Anu Elizabeth Cherian, Frost & Sullivan senior industry analyst, says many SMEs are well prepared, but from a backup power standpoint, skipping even one maintenance check can be costly. The key determining factor in understanding preparedness at any given time, she says, is ensuring quarterly service and maintenance checks are completed and equipment is

ready. "However, in cases where the backup power equipment is just not sufficiently designed to cater to the needs, curbed capital expenditure and its impact on spending on backup power is the first sign of unprepared SMEs," she says.

UPSes will address many issues, with battery UPSes being the most common type. However, Dines says, "they need to be exercised and replaced every three to five years, something that some organizations tend to neglect." Though it's common for organizations to not have adequate capacity of emergency generator power for all critical systems, she says, many workloads today are virtualized and easily portable. Thus, mission-critical systems may not physically reside on the rack units they were originally deployed on, leading to

outages of mission-critical systems while non-critical systems remain powered.

Execute Effectively

Upfront, Cherian says, "the person undertaking the electrical and management systems should have experience and knowledge in handling and maintaining logs." Further, there should be multiple levels of personnel conducting checks of backup power equipment and monitoring to eliminate single points of failure. Here, remote monitoring is a valuable tool. Though it might seem expensive, remote monitoring "provides the data to keep systems running. Documentation should be reviewed on a quarterly basis," she says.

Dines sees writing continuity plans, keeping them up-to-date, and periodically

testing them as the most important thing companies can do to ensure preparedness. "Maintaining continuity plans is all about responsibility, so it's important to make sure there's an individual or individuals whose goals are tied to delivering up-to-date and effective plans, as well as testing these plans at regular intervals," she says.

Longbottom says UPS and generator vendors should be able to recommend maintenance schedules and checklist points. "Don't try and save money by leaving any services out or leaving parts of services out," he says. "Although this is all just an insurance policy against things going wrong, it will not reflect well on you if, when the need arises, things don't work because you've tried to save money by not doing what was necessary."

Top Tips

- ✓ Address non-emergencies. "Dirty power" is one non-emergency power issue that can negatively affect IT equipment, says Quocirca service director Clive Longbottom. Spikes, for example, can destroy equipment that is not well protected, while low voltages can cause equipment to drop out. Noisy feeds can also affect data quality if power lines and data cables run close together, he says. "All this should be considered in a holistic manner when it comes to an emergency power strategy."
- ✓ Start with this equipment. Overall, every small to midsized enterprise should have UPS systems, fully functioning batteries, and a backup generator if possible to take over in the event that the power outage lasts longer than the UPS can support, says Anu Elizabeth Cherian, Frost & Sullivan senior industry analyst. She says maintenance and correct sizing of the UPS for the needs of the system is an aspect of emergency power systems that companies tend to overlook.
- ✓ Don't forget the fuel. Make sure to check both fuel supply and quality. Rachel Dines, senior analyst at Forrester, says there have been many recent examples of organizations successfully transferring over to generated power but being forced to shut down operations when fuel supplies ran out because they hadn't pre-arranged for emergency fuel shipments or weren't keeping an adequate amount of fuel onsite.

Action Plan

Forrester senior analyst Rachel Dines suggests following these steps prior to developing an emergency power plan:

- Understand the company's specific power requirements.
- Determine the availability and recovery rates required.
- Determine the business' risk tolerance.
- Understand the risk profile of your region.
- Use the business requirements and risk profile to design an appropriate solution.



Get Started

Keeping a monthly (or quarterly at the least) status log of UPS equipment and batteries is good starting place for organizations in terms of planning for power emergencies, says Frost & Sullivan senior industry analyst Anu Elizabeth Cherian. Timely replacements and having the proper amount of resources/capital available at any given time for necessary changes to existing backup power equipment is also important for developing and executing effective maintenance. Many UPS manufacturers offer cost-effective packages for 24/7 customer support, maintenance, warranty services, and service contracts after a warranty expires. A less expensive alternative is independent, brand-neutral, third-party service providers.

Forrester senior analyst Rachel Dines says baseline components for addressing emergency power solutions include a generator, fuel, transfer switch, and UPSes. Each, she says, "can be deployed in N, N+1, 2N, or even 2N+1 configuration depending on the risk appetite of the business." Maintaining redundant power feed from different grids is another possibility for companies seeking additional resiliency, she says.

New Trends In Data Center Design

Capacity Planning, Environmental Monitoring & Other Elements Shape The Future

DATA CENTER DESIGN is a constantly changing concept. With new advancements in technology and new ways to build facilities, companies have more options than ever when building a new data center or redesigning an existing facility. That's why it's so important to do your due diligence during the planning process and make sure you take all available trends into account when designing your data center. We'll tell you about some of the most interesting trends in data center design and help you determine whether it's a fit for your company.

✓ Develop A Forward-Thinking Design Strategy

Data center contents and layout will change over time. Your facility's capacity may be enough for your current needs, but you have to prepare for the future, which will hopefully include more employees and many more customers. But it's not always the data center infrastructure that's the problem. "It's the IT equipment that's really the problem," says Hassan Moezzi, CEO of Future Facilities (408/436-7701; www.futurefacilities.com). "People keep talking about infrastructure issues such as power and cooling, but they're actually a byproduct of the original cause—equipment," he says. You have to build your infrastructure to house a "moving target."

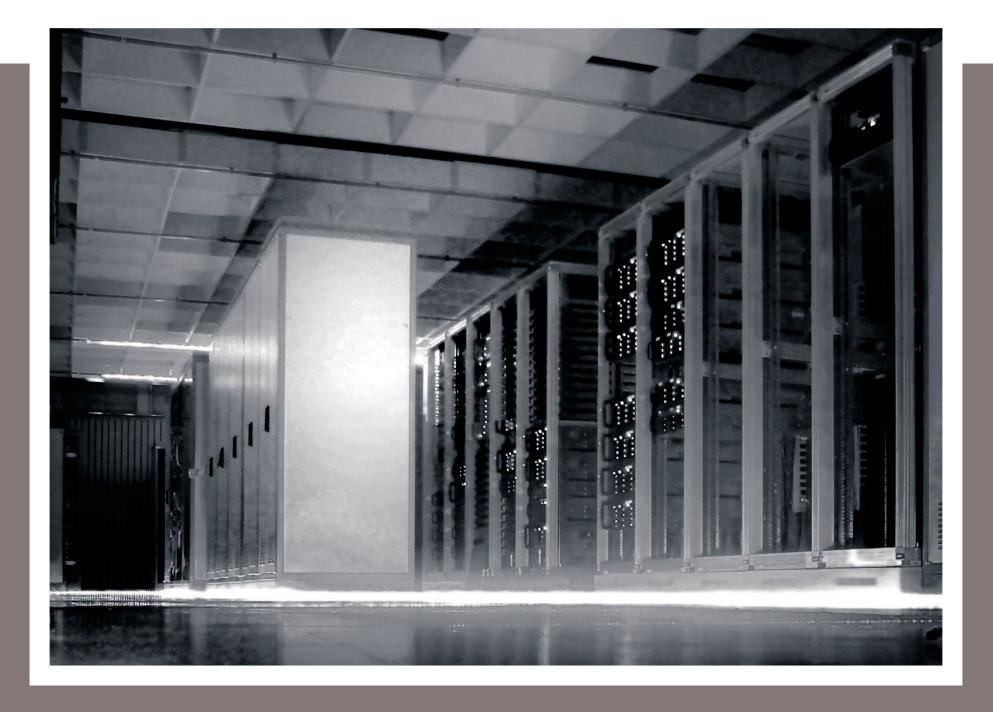
For this reason, predictive monitoring and design tools are a great resource that can help you better visualize your data center layout and get an idea of what capacity you may need in the future. Moezzi recommends companies invest in solutions that help you build a "virtual facility" that will serve as a "sandbox from an engineering point of view." You can use these solutions to monitor capacity, but also use the gathered data to visualize how new equipment or changes to your data center layout and overall design will impact power, space, and cooling.

✓ Design With Environmental Monitoring In Mind

The environmental conditions of your data center are important when it comes to the efficiency and performance of the facility, so it makes sense to include monitoring in your overall design approach. For instance, Dave Ruede, vice president of marketing at Temperature@lert (866/524-3540; www.temperaturealert.com),

recommends companies look into CFD, or computational fluid dynamics, solutions that will help you "design and predict the power and cooling requirements to maintain electronic racks at their specified temperatures."

But Ruede warns that, because of cost and other factors, CFD solutions are not always available for small to midsized businesses. In those situations, he says companies should instead consider solid DCIM systems that have specific environmental monitoring tools built-in. "A robust DCIM environmental monitoring implementation is recommended to ensure operation is as expected and changing conditions are monitored for potential problems," Ruede says. If you can implement DCIM and environmental monitoring solutions into your initial data center design, you can get a much



more in-depth view of your facility and its requirements from the beginning.

Expanding Modularity Beyond Racks & Equipment

Modularity is a big trend with racks, cabinets, and equipment, with most vendors developing new ways to make life easier for data center designers and IT teams. After all, if every piece of equipment in your data center can work together and is flexible enough to be upgraded without much trouble, you'll be much better off in the long run. But perhaps one of the most interesting trends in modular data center design is actually making the server room or other space itself modular.

"If, for example, you have a large square footage space that isn't fully occupied, you

might not need to cool that entire space," says Darin Stahl, lead research analyst at Info-Tech Research Group. "Maybe you use some temporary walls to contain the room that can be removed later if you need the space, so you are only cooling the part of the data center currently being used. Thinking about it in a modular fashion is a very strong trend that leads to lower OPEX and better outcomes from an availability perspective."

The idea of cooling spaces more efficiently through the use of temporary walls is an attractive money-saving option, but it isn't the only example of facility-based modularity. You can leave open space below the floor or above the ceiling for cable management and expansion purposes. You can also create a layout that leaves room for future expansion, knowing exactly how big

each individual component is and leaving enough space to accommodate new equipment. There are many ways to take advantage of built-in modularity as well as ways to build your own modular design. Creating a plug-and-play atmosphere can help future-proof your data center facility and ease the headaches of your IT employees.

Think About Cooling Efficiency & Green Energy Alternatives

In addition to environmental monitoring, Ruede says that companies should focus on cooling efficiency during the data center design process. "Incorporation of free cooling through the use of either direct or indirect economizers is a significant trend both for new and existing sites," Ruede says. These are situations where, due to climate or location, data centers can take advantage of natural air or water cooling at a much lower cost than installing standalone cooling systems.

But there are other energy and green technology-related design choices companies should consider from the beginning. Onsite green energy options, such as photovoltaic panels or wind turbines, should also be considered, Ruede says. "The project budget and return on investment will dictate the final design and whether or not solutions are implemented." And it's also important to remember that these approaches are not available to all data centers, so you need to consider your location and climate when designing your data center. You could end up saving quite a bit of money simply by taking advantage of natural resources and green technology investments.

✓ Plan Ahead Before Jumping Into Trends

Data center design trends are important, and it certainly helps to educate yourself as much as possible, but it's equally important to look at your data center as the long-term investment it is and plan ahead before you make big moves.

"The first thing you want to think about is what your current state is, and then form a technology road map," says Darin Stahl, lead research analyst at Info-Tech Research Group. "Think about all of the servers you have, power, cooling, and communications, and also think about where you're going to be in five years or seven years."

Stahl stresses that companies are "building an envelope" that they will have to live in "for probably 10 years" and that it's crucial to get a solid balance of end-of-life equipment extension and new technology purchases. You have to look ahead as far as you can and follow the technological path that best fits your company. Look at where your company is right now and be aware of the type of facility you want to have in the future. With that solid foundation, you'll know almost immediately which trends are truly worth pursuing.

✓ Improve Temperature Control

Companies should take advantage of the design process to not only improve the layout of the data center but also get a handle on temperature- and environmental-related issues. "Surprisingly, many sites, especially those where IT equipment has been added or changed, have not taken the time to map the current operating temperature profiles," says Dave Ruede, vice president of marketing at Temperature@lert (866/524-3540; www.temperaturealert.com). "Racks can and do interfere with airflow. Changes under raised floors can interfere with airflow, starving some racks and flooding others. Taking time to map temperature profiles is an important way to stay on top of the effect of changes and ensure all equipment is running at recommended temperature ranges for optimal performance and reliability."

BONUS TIPS:

✓ Seek Advice From Other Companies

"Some companies regard their data center designs as a proprietary competitive advantage," says Dave Ruede, vice president of marketing at Temperature @ lert (866/524-3540; www.temperature alert.com). But, he says, others simply use best practices that many companies can also take advantage of. He recommends contacting companies with similarly designed facilities that can help you "uncover insights to lessons learned" as well as possible improvements you can make to your own design plan.

✓ Talk With Vendors

You should always be willing to speak with product vendors about changing technology that will fill in your facility's layout, Ruede says. Solutions such as servers, DCIM, and environmental monitoring tools tend to evolve rapidly. Instead of simply going with the flow, Ruede says that "comparing options, while timeconsuming in the beginning, can help ensure that a reliable and cost-effective solution is selected."

Configure, Install & Test New Data Center Servers

Successfully Bring New Servers Into Production

UPGRADING SERVERS is no small feat. Beyond the scads of configuration considerations that come into play, there's also a bevy of installation and testing details to tend to. In short, bringing new servers into production is far more complex than simply swapping out the old for the new. The following provides tips and advice regarding the configuration, installation, and testing processes; who should be involved; precautions to take; and more.

✓ Follow These Steps For Successful Setup

The reality for many small to midsized enterprises is that they don't possess large IT or systems administrator groups. Installing various open-source tools and piecing together different hardware and software components can be challenging, "especially with the software tools that have little or no commercial support," according to Supermicro (408/503-8000; www supermicro.com).

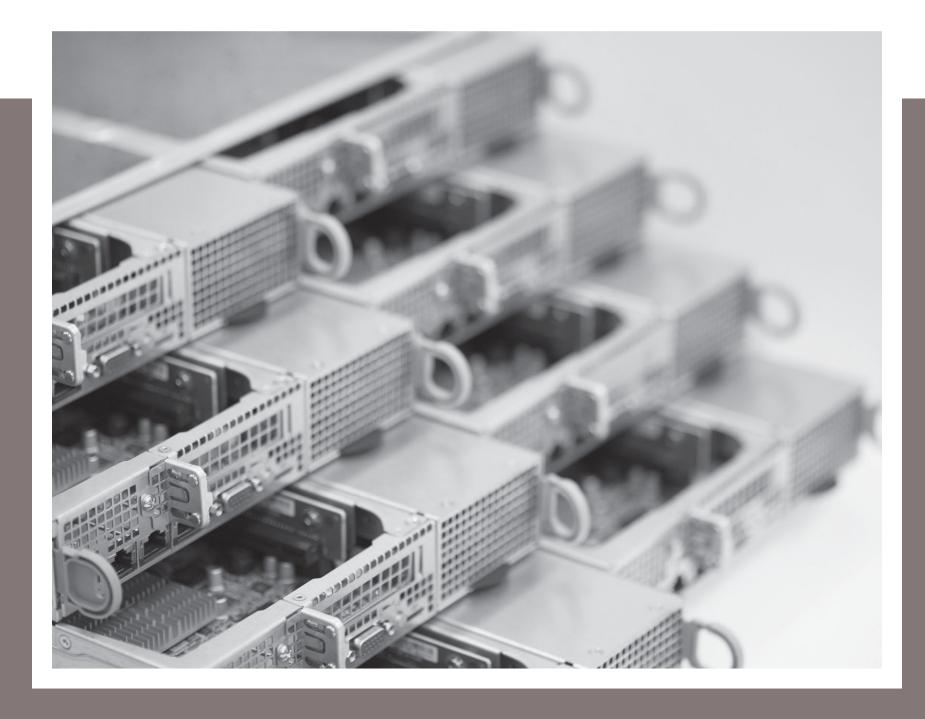
Another potential hurdle is trying to use hardware from various vendors that may not be designed to work together and can result in project delays and lost revenue. A better approach to upgrading servers is working with a vendor and partner that provide all the key equipment and support necessary and are able to install full-rack and multirack solutions, according to Supermicro. Overall, a vendor and its channel partners can offer a good onestop shop for a complete IT solution.

When it comes to installation, configuration, and testing, Charles King, principal analyst at Pund-IT, advises following the "5W + 1H" formula that reporters and police use during investigative processes. In other words, ask who, what, when, where, why, and how. "Consider what the goal is and why you're pursuing it, then determine who will perform those tasks, as well as where, when, and how they will proceed," King says. The key is working mindfully and systematically toward achieving a predetermined goal, he says.

✓ Avoid These Common Mistakes

Greg Schulz, senior advisor with Server and Storage IO Group, says that beyond selecting the wrong type of server or selecting a server for the wrong reasons, other common mistakes can include not properly accounting for processor performance, DRAM abilities, I/O for storage and networking expansion capabilities, PCI-E slots and types, management tools, and firmware/software compatibility challenges in meeting application needs. Another common oversight is not identifying and planning for power, cooling, management, and physical facility constraints.

King says one mistake is moving forward without establishing or considering a final destination for the installation, configuration, and testing effort. This occurs most often, he



says, if a project is tactically-focused, such as simply spinning up a new business application or scaling a system to support additional users. Another mistake involves companies assuming "past IT solutions will be adequate for new or evolving business problems," he says.

Supermicro says companies that don't own their data center must take the data center environment into consideration as they can't dictate design parameters to meet their requirements. Rack density, cabling design, power budget, and cooling capacity should be addressed. Supermicro suggests working with an experienced supplier to help speed up server deployment and avoid unnecessary mistakes.

✓ Include Several Groups During Installation, Testing

Bringing a server onboard should involve numerous parties. Installation, for example, should involve facilities or those responsible for primary and standby power, cooling, floor space, and verifying equipment gets from a shipping truck to its final destination, Schulz says. From a configuration standpoint, he says, those who helped determine criteria for the server selection process should participate in deployment, as should those responsible for OSes, virtualization tools, KVM, storage, networking, and operations/management.

Schulz says different testing levels will involve different personnel. Basic

functional tests that ensure the POST runs OK and the equipment is installed per manufacturer instructions might involve the vendor or its VAR or business partners, as well as onsite management or operations personnel, he says. Another level of testing should entail running benchmarks, workload simulation, or actual customer workloads to verify and validate that the server meets or exceeds customer expectations.

For the configuration process, Schulz says, don't forget to involve those individuals "responsible for networking the server to SANs, LANs, WANs, and MANs," and also involve "whoever will be handling management, configuration, setup, storage, backup, virtualization, and related tasks."

Work Around Limitations

Compared to larger enterprises, small to midsized enterprises typically lack a large supply chain or considerable bargaining power. For example, larger enterprises may be able to request that a supplier quickly remedy a BIOS or firmware bug, but smaller enterprises will need to more thoroughly test and validate servers. "A good approach is to buy only the servers that have been certified with the OS or software applications," according to Supermicro. Be sure to heed application compatibility and OS and driver support, and after putting servers into production, update the driver, firmware, and BIOS to current versions.

✓ Plan For Growth

Supermicro (408/503-8000; www.supermicro.com) notes that many small to midsized enterprises are "nimble and have high growth rates." Because of this, where server deployment is concerned, "future growth has to be put into consideration," according to Supermicro. "SMEs need to develop a strategy that installs and configures servers in the pace that meets their business growth." From a server, storage, and networking perspective, all key equipment should be benchmarked with the real application to determine if it is capable of supporting the current workload and the growth of the future workload. Overall, a bit of extra investment can go a long way, as many smaller enterprises will outgrow their IT resources, according to Supermicro.

✓ Make Sure You Get What You Pay For

Greg Schulz, senior advisor with Server and Storage IO Group, advises taking several precautions, including having a plan and a process that focus upfront on validating configurations before orders are placed and validating what was shipped vs. ordered. Also set expectations; get concurrence and support from those involved; keep everybody informed of status updates; and allow lead time for power, cooling, floor space, or other items and tasks that require advance notification. "Avoid surprises by planning ahead, learn from mistakes, work those into the plan for future upgrades or installation via continued improvement, and capture that knowledge in a document or some other means," he says.

BONUS TIPS:

✓ Plan, Process & Communicate

Charles King, principal analyst at Pund-IT, says problems related to server installation, configuration, and testing can generally fall into three categories: planning, process, and communications. Planning refers to issues that arise during a project's preparation phase. Process relates to common and unusual errors made during the installation/deployment implementation. "Communication issues are among the most difficult to address, mainly because they span everything from simple misjudgments . . . to gross or even willful ignorance," he says.

✓ Seek Vendor Support

You can expect and get vendor support, either directly or from a representative of a VAR or business partner, upfront during the configuration on through the initial testing and validation phase, says Greg Schulz, senior advisor with Server and Storage IO Group. But if you're only shopping for the lowest-cost server you can find, expect less assistance, he says.

Page 34 Processor.com January 11, 2013

BUYING TIPS:

Data Center Racks & Cabinets

RACKS AND CABINETS are built to hold and protect every piece of equipment that runs your data center. Because of that, the decision of which racks and cabinets to purchase shouldn't be hastily made. Instead, you should focus on the features most important to your company and ensure they will fulfill your needs for years to come.

✓ Know What's Currently On The Market

The first thing you should do when looking at racks and cabinets is research what's currently on the market. Companies offer full-sized 42U, midsized 26U, and 12U cabinets as well as racks with heights of 30 to 84 inches and widths of 24 to 36 inches.

Eli E. Hertz, CEO and president of Hergo (888/222-7270; www.hergo.com), says you should look for potential add-on items, such as overhead storage compartments, power and cable management solutions, and back and side panels. Different sized racks and cabinets paired with additional solutions can help you design a product that's perfect for your data center.

✔ Pinpoint Your Needs

Once you know what products and configurations are available, look at the types of physical features you need for your specific environmental needs.

"Establish what you need the cabinet to do," says Susan Wynne, senior sourcing specialist for Rackmount Solutions (866/207-6631; www.rackmountsolutions .net). "If the equipment is noisy, you may want a sound reduction cabinet. If the environment is dirty, you may need a filtered cabinet. Even the area of the country is important, and you may need an air-conditioned or NEBS cabinet."

There are many other considerations you must make, including whether you have a sprinkler-based fire suppression system that requires NEMA 12 certified cabinets that keep out moisture, Wynne says. You should also consider built-in security measures, such as locked cages or other alternatives, if there is a lot of traffic in and out of your data center.

✓ Check The Vendor

Hertz says that a cabinet or rack purchase is significant and so the decision of which vendor to buy from is just as important. "You need to make sure that the supplier they have chosen has been in business long enough to have an established reputation in the market," he says.

Hertz says companies should be able to "grill the supplier on what they are actually going to be getting," and the vendor should be able to answer those questions by knowing "the product from nuts to bolts." Think of the vendor as a partner in the purchasing process and make sure it gives you enough information to make the best possible decision.

✓ Get The Right Fit

In most cases, you've already decided which pieces of equipment to buy for your data center before you start shopping for the racks and cabinets to store them in. It's a great opportunity to measure each piece and come up with a mock configuration for how it will fit into the rack or cabinet.

"This ensures the cabinet is tall enough, wide enough, and deep enough to handle the longest piece of equipment to be populated into the cabinet," Wynne says.

But don't let internal space be your only focus, because the amount of space the rack or cabinet takes up is equally important. "Make sure the outside dimensions of the cabinet will fit in the designated location," she says. Whether you are purchasing multiple racks and cabinets to fill a brand new data center or buying one to fit into an existing setup, it's important to know every dimension. And make sure you leave adequate space for expansion in the future. If you don't, you could get stuck with a cramped and inefficient data center with no room for evolution.

BUYERS' CHECKLIST

- ✓ Is cable management built-in, or does the rack or cabinet leave adequate space to neatly route cables?
- ✓ Does the rack/cabinet provide PDU mounting options such as brackets?
- ✓ Does the equipment you're mounting require tapped or M6 holes?
- ✓ Will you need to disassemble the rack/cabinet to get it in the room?
- ✓ Is the cabinet lockable to prevent potential security issues?

KEY TERMS

M6 holes.

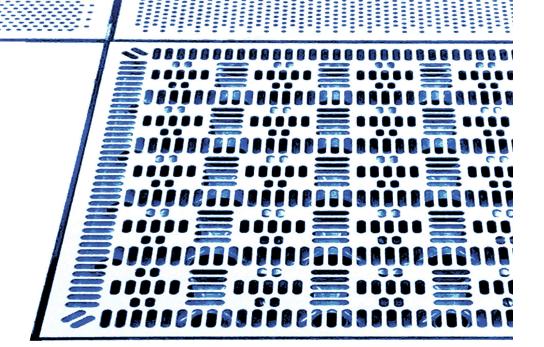
Square holes common with rackmount equipment and server cabinets; they can be adjusted to a round hole with a cage nut.

Rackmount units (RMU).

Cabinets and racks are measured in rackmount units, with each RMU, or U, equivalent to 1.75 inches.

BUYING TIPS:

Data Center Flooring & Accessories



YOUR DATA CENTER'S FLOORING can be just as important as the servers and other equipment it holds. Choosing the right flooring provides a stable, efficiently cooled data center. Here's what to look for.

✓ Know The Weight

Raised floor tiles come in different weight capacities, so consider your weight-bearing requirements when selecting tiles, says Ken Koty, sales engineer at PDU Cables (866/631-4238; www.pducables.com). The final floor has to be strong enough to support your

equipment at the height of the raised floor. Also be aware of rolling load and use heavyduty floor tiles where you will be moving equipment in and out of the data center.

Remember as rack sizes grow and densities increase, your floor tiles may need to support a greater weight than you have today. Plan ahead and install floor tiles to meet current and future needs, Koty says.

✓ Check The Finish & Material

Be careful when selecting the floor finish, Koty says. "You don't want be

constantly replacing tiles in high-traffic areas to keep the floor looking uniform."

Avoid floor tiles wrapped in galvanized metal, Koty says, as the galvanized-wrapped tiles could cause zinc whiskers over time. And, if you are using cement-filled tiles, use a sealant to coat any cut edges of your tiles.

You'll also need to consider static dissipation and material weight, says Laura Viars, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmount solutions.net). "Data center flooring needs to have a surface that is conducive of static dissipation," she says, to prevent the build-up of static electricity. In addition, she says, "lightweight solutions, as well as 'lay-down' panels rather than bolt-down ones, can make maintenance or swaps significantly easier."

✓ Be Aware Of Cooling & Height

If you can maximize the available space underneath the floor, you can increase your data center's overall cooling efficiency. Also, Koty says, if you want your new flooring to accommodate a hot/cold aisle configuration, make sure to plan your under-floor cable layout according to CRAC and PDU/RPP unit locations.

✓ Plan For Cutouts

When installing flooring, a master floor plan should show the location of all cabinets in the full build-out state, says Lars Strong, senior engineer at Upsite Technologies (888/982-7800; www.upsite.com).

Using this plan, it's best to cut cable openings in floor tiles and install products that seal those openings as the floor is installed. Doing so will reduce labor, prevent contamination, and ensure that every cable opening is sealed. "If this best practice is not followed, then it is less likely that the ultimate goals of providing the most reliable and efficient environment, the highest possible power density, and lowest operating cost can be achieved," he says.

✓ Don't Cut Corners

You may be tempted to cut corners to save money, but don't, Viars says. "Don't compromise on the integrity of your flooring. Make sure floor panels fit together as intended (even if it requires custom cutting/sizing), and spring for the additional airflow management accessories. It might cost a bit more upfront, but it will ensure that your cooling remains effective."

BUYERS' CHECKLIST

- ✓ Do the flooring panels fit your needs and allow for effective cable management?
- ✓ Is there enough open space underneath the floor for cable routing and cooling?
- ✓ Does your vendor have a stellar reputation and testimonials from past clients?
- ✓ Are all sections of the data center flooring capable of handling the weight and traffic to which they will be subjected?

KEY TERMS

Bypass airflow.

Conditioned air that does not reach computer equipment. Unintended bypass airflow can occur by escaping through cable cut-outs, holes under cabinets, misplaced perforated tiles, or holes in perimeter walls.

Concentrated load rating (also referred to as static load).

Rating specified in pounds of force applied over a one square inch area.

Directional airflow.

Airflow panels such as perfs and grates that deliver air directly to the face of the rack.

Panel.

The material that makes up the walking surface of a raised floor. Depending on your weight and traffic needs, the panel may be made from steel, concrete with steel reinforcing bars, or aluminum.

Rolling load.

Dynamic (varying) loads that are usually created by moving equipment on casters over the raised floor.

BUYING TIPS:

UPSes



THE IMPORTANCE OF UPSES can't be overstated. If power outages occur and the data center doesn't have UPSes in place that can meet necessary power requirements, the result will be potentially business-crippling downtime.

✓ Learn Your Total Load, Maximum Runtime & Voltage Available

Narrowing down what you need in UPSes can be difficult, and the number of options available can complicate matters. "You have to start with some basics and be armed with some knowledge before making a selection," says Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

Know the minimum time UPS batteries must provide power and the maximum runtime needed. "You'll also need to know the voltage of the electrical service that will power the UPS," he says.

Perhaps most importantly, know the total load of all equipment you'll connect to the UPS, so you can make sure the unit is sized correctly for the load necessary, says Neil Matheson, director of UPS and Special Services at Critical Power Exchange (877/630-7520; www.critical power.com). You'll also need to make sure you have enough physical room to place the needed equipment.

✓ Look To The Future

Along with a firm understanding of the equipment you want to protect right now, you'll also want to consider what equipment you might be adding over the next 24 to 36 months, Matheson says. "A safety margin of 50% for a new installation is usually the rule of thumb to allow for growth."

Also be sure to account for unexpected additions that will inevitably crop up. Doing so will ensure you avoid purchasing a UPS that meets your needs now but becomes outdated in the near future.

✓ Know The Features & Options

The UPS features your enterprise needs can depend greatly on the protection level required for given applications.

"Which option is best for the consumer depends really on them and their environment. Some people plug in a UPS and walk away. Some people go in the other direction and have the units serviced every four months in a fiscal year," Matheson says.

He says key features to look for include external maintenance bypass; cabling cabinets, if needed, depending on the size of the UPS in kVa; and remote eye and/or other SMTP devices to alert system administrators of the UPS' activity or lack thereof.

Femrite agrees, but points out that, although it's desirable to have a UPS with a high efficiency rating, external bypass

switches that enable power to bypass the UPS for maintenance purposes, monitoring capabilities (local and remote), warranties (system, batteries, etc.), and high-performance filtering, "they may not all be needed or cost-effective."

✓ Determine Whether It Makes Sense To Buy Used

There are plenty of used and/or refurbished UPSes on the market thanks in part to companies that have gone out of business or upgraded UPSes with useful life left in them.

But Darin Stahl, Info-Tech Research Group analyst, cautions that the economic downturn has caused enterprises to view their equipment differently. "The refresh cycle on the equipment has gotten longer, so what that means is there's less available used equipment because they're hanging on to this stuff and wringing every ounce of usefulness out of it," he says.

For example, Stahl says, some companies are holding on to their UPSes until the seven-year mark. If that's the case, he says, "Maybe I save some CAPEX, but I more than consume that in OPEX because of efficiency loss if I'm buying used gear."

As with any used equipment you purchase, make sure to check the UPSes carefully, including their history, and purchase from a reputable reseller.

BUYERS' CHECKLIST

- Determine your power and protection requirements.
- Ensure the UPS can handle required loads.
- Make certain the UPS provides sufficient runtime and capacity.
- Consider outsourcing battery installation, maintenance, and disposal duties.
- ✓ Determine warranty, insurance, and guarantee requirements.

KEY TERMS

Line-interactive.

A UPS with built-in line-sensing abilities to regulate high- and low-voltage levels; an inverter activates when power loss occurs and the system switches to battery power.

Online.

A UPS type providing the highest protection level; the inverter is online and operates constantly to eliminate incoming surges and low- and high-voltage issues while delivering clean power.

Standby.

A UPS type that runs power through surge suppression to connected equipment; after a power outage, the UPS switches to battery backup power, reverting to AC power when power returns.



Data Center Cooling

DATA CENTER COOLING is as vital a concern as storage capacity and security: Data centers run more efficiently and reliably with the proper temperature, and uptime is everything. Having the right equipment is essential.

✔ Plan, Plan, Plan

"The biggest mistake you can make is to not plan properly," says David Manke, who specializes in cooling equipment sales at Critical Power Exchange (877/630-7520; www.criticalpower.com). "Poor planning can, at the minimum, result in unforeseen expenses and lost productivity. Worst-case scenarios can include equipment failure, downtime, and breach of contract with customers," he says.

Before purchasing cooling equipment, Manke says you need to answer several questions: How much cooling (BTUs) is required for equipment to remain at the required temperature? Does your site require a closed- or open-loop system? Where will the cooling equipment be located? Is noise a concern?

Also make sure you know and understand all the options available. The right solution will incorporate the amount of heat the equipment generates, logistical limitations of the site, the power efficiency, the ambient temperature in your location, and more.

✓ Make Sure You Need More Cooling

Without having a firm understanding of your data center, airflow, and cooling, you could be purchasing cooling equipment when you don't need it, says Lars Strong, senior engineer at Upsite Technologies (888/982-7800; www.upsite.com).

"Over a decade of load and capacity measurements in computer rooms continues to show that, on average, computer rooms have an installed cooling capacity that is 250% of the IT load," Strong says. "This vast over-implementation of cooling is often the result of poor airflow management and a lack of understanding of loads and capacities." Typically, 120% of load is more than adequate to account for redundancy.

To see if problems in the computer room are a result of capacity limits or distribution challenges, calculate the Cooling Capacity Factor, or CCF, Strong says. It is the ratio of total installed nameplate capacity to critical load. This ratio should be about 1.2, or 120%.

✓ Decide Between Portable & Permanent

Weigh the pros and cons of portable and permanent air conditioning systems, says Clark Michel, vice president of Atlas Sales & Rentals (800/972-6600; www.atlassales .com). "The installed cost of a portable cooler can be dramatically lower," he says, as a permanent system often entails at least some construction and installation costs. Plus, maintenance is also simpler with portable systems.

When purchasing a portable unit, Michel says, be sure to use a high-quality commercial-grade portable air conditioner and consult with your equipment supplier to make sure you get a unit that will handle the total heat load. "It is actually not a bad idea to oversize portable equipment slightly."

✓ Maximize Your PUE

The cooling infrastructure typically consumes half of the total energy, Strong says, offering opportunity to improve PUE. For chilled water systems, variable-speed fans can

produce substantial savings and flexibility as loads in the room vary. For DX systems, free cooling coils are important to consider, particularly with partial or full containment. "As these best practices are implemented, the temperature set points of the cooling units can be raised without adversely affecting the intake conditions of the IT equipment," he says.

✔ Don't Forget About Airflow

"A great deal of money is thrown away on cold air that just doesn't reach the equipment," says Laura Viars, senior sourcing specialist at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net). If you can add filler panels and other add-ons to your cabinets and racks, then you can direct cool air to where it's needed. This is a relatively inexpensive solution to cooling issues, and it could result in long-term savings.

BUYERS' CHECKLIST

- ✓ How many BTUs do you need to keep your equipment at the appropriate temperature?
- ✓ Do you really need the additional cooling equipment?
- ✓ Do you need a closed- or open-loop system?
- ✓ Where will the cooling equipment be located?
- ✓ How much of a concern is noise output?

KEY TERMS

British Thermal Units (BTUs).

Used to measure the amount of energy required to heat a liquid such as water. A single BTU represents enough energy to raise the temperature of one pound of water by one degree Fahrenheit at a constant pressure of one atmosphere. In the context of cooling equipment, BTUs are listed as a given rating per hour.

Cooling Capacity Factor (CCF).

The ratio of total installed nameplate capacity to critical load. This ratio should be about 1.2, or 120%.

Power Usage Effectiveness (PUE).

A technique used to help enterprises measure how much of their total data center energy usage is going toward IT and computing equipment.

Equipment Recycling & Disposal



THERE COMES A TIME WHEN enterprise equipment becomes outdated, needs to be replaced, or is simply no longer of use. Such situations require getting rid of the old to make room for the new. One option for dealing with old equipment is reusing it in another capacity, such as repurposing a once high-end server for an application that doesn't demand mission-critical performance. Another option is using a vendor that specializes in refurbishing, recycling, and disposing of old equipment.

In addition to handling equipment in an environmentally responsible manner, a vendor can ensure you abide by privacy and compliancy regulations. When it comes time for you to find an equipment recycling and disposal vendor, the following advice can help.

✓ Educate Yourself

Having a better understanding of the equipment recycling and disposal market is a key first step in the process. Nicholas Peterson, director of marketing at Critical Power Exchange (877/630-7520; www.criticalpower.com), says you need to know what you are recycling and have an idea of what prices are. "Separate your materials. Know scrap vs. refurbished. Know ferrous vs. non-ferrous metals. Know how to properly classify your materials," he says. These things will help you to make better decisions about what to do with your equipment and the equipment recycling/ disposal vendor you choose.

✓ Compare Providers

When comparing service providers, examine what the services are offering, says Brett Femrite, director of business development for Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).

"Some of the larger companies charge for asset disposal, while others will pay you for the equipment. Smaller regional companies can often provide more cost-effective solutions because of local transportation, labor, and processing," he says. Companies that offer to pay you may provide revenue sharing and the ability to purchase other refurbished hardware. "Ask for referrals, performance reports, or projections up front. Looking at past disposal lists will make it easy to forecast what you can expect," Femrite says.

✓ Check The Facilities & Processes

One of the biggest mistakes enterprises make is having a lack of experience with their chosen recycler, Peterson says. That's why it's essential that you know several elements. "Where is the equipment going (landfill vs. repurpose vs. scrap)?," he says. What's the reputation of the recycler? "Does the recycler show concern for where the equipment came from? Are you getting fair dollar return on the recovered assets?"

Ask prospective vendors if you can physically inspect their facilities, what security

and surveillance they use, how they can assist with ROI for current projects, and what documentation processes they use.

Be sure to find out how equipment is picked up and handled, who pays for shipping and transport, how equipment is processed and how long it takes, where equipment winds up, when you will get paid, and if the vendor can assist in other ways such as providing new products or offering credit from old equipment. You also should check what current accounts the vendor has and if it uses downstream vendors and who they are.

✔ Onsite Or Offsite Data Destruction?

With data destruction, you have two choices: onsite or offsite. With an onsite service, you'll remove the need to deal with a chain of custody documentation. For data centers that store a lot of sensitive data and want to physically destroy the data, you'll enjoy the peace of mind that comes with watching the destruction take place.

If you want absolute destruction that's beyond any type of recovery, an offsite data destruction service may be ideal as service providers typically have more powerful shredders at their facilities than mobile shredder services can offer, plus a number of offsite data destruction services also double as a reprocessing center that can remarket the parts, so you can get some return value for your used equipment.

KEY TERMS

Data wiping.

A process used for compliancy and privacy reasons in which data is entirely destroyed or erased from equipment such as hard drives.

Refurbished for reuse.

Old equipment that has been restored to be resold or donated for continued use rather than recycling individual components.

BUYERS' CHECKLIST

- ✓ Homework. Compile a list of equipment you no longer need, then determine its resale value, what businesses might purchase the equipment, and how the resale value can help fund new purchases.
- Qualifications. Determine how long the prospective vendor has been in business, what its reputation is in the industry, and what compliancy and certification measures it operates by and has achieved.
- ✔ Broker or provider. Determine if the vendor actually provides recycling and disposal services or is just a broker of such services.
- ✔ Process. Clarify the methods the vendor uses to process equipment, including who handles equipment, where it goes, how long processing takes, and what documentation you can expect.

Colocation Providers

GETTING IT RIGHT THE FIRST TIME is crucial when selecting a colocation provider, says Darin Stahl, Info-Tech Research Group lead analyst. "When you get into a colocation, switching costs are enormous," he says. "This isn't like buying a bunch of photocopiers, being unhappy with them, and putting them to the curb and getting new [copiers] in. It's a big deal to go through switching." To find a good fit with a colocation provider, consider the following.

✓ Understand The Options

Stahl says the colocation/managed service providers market can be categorized into three tiers. Tier one vendors typically have significant market influence and enormous geographic scale, he says. Tier two vendors generally have the same qualifications but less market influence and possibly less geographic scale. Tier three vendors are basically everyone else, he says.

Although price is a factor when comparing providers, it shouldn't be the driving factor. Smaller colocation providers that compete on price and don't own their facility typically can't offer an iron-clad SLA around the actual facility, Stahl says.

Lynda Stadtmueller, program director for cloud computing services at Frost & Sullivan's Stratecast division, agrees, adding, "There's too much at stake . . . to go low bid." Colocation, she says, "is not a commodity; every provider has different configurations, capacity, processes, and systems that can seriously impact your applications."

✓ Consider Usage & Location

Be sure to consider how you want to use the facility and for what purpose. Some companies invest in colocation so they can cut down on internal data center and infrastructure costs while others hope to set up a safe solution for disaster recovery. Once you know how you intend to use equipment in your colocation environment, you can then find the best location.

✓ Make Sure There Is Room For Growth & Expansion

Although it's important to put a heavy focus on what your company needs now in terms of equipment and performance, it's also crucial to look to your company's potential future needs and ensure there is enough room for expansion years down the road. Instead of backing yourself into a corner, make sure your colocation provider's facility is flexible enough to support more or less equipment depending on whether you wish to expand or consolidate at a later date.

✓ Know The Reputation Of Your Provider & Its Facility

Checking a colocation provider's past history is as important as making sure it's in a safe location, if not more so. Request customer referrals whenever possible and gather as much information as you can about the provider before you make your decision.

✓ Check The SLA

"Be sure to compare the SLA to the services you are planning to use," advises Brett Femrite, sales manager at Rackmount Solutions (866/207-6631; www.rackmount solutions.net). "Some SLAs have varying levels of coverage based on the services that

you choose. Be sure to note whether there is a redundant service offering that you must opt in to use in order to be fully covered by the SLA. Examples include A/B power or redundant network connections."

Stahl says to push for the contract to include an annual services review and ability to right-size or contract services so you don't pay for, say, server space you don't need down the road. Some of the best vendors do this upfront, he says, while others will with a push and some not at all. Conduct a quarterly operations-style meeting with the vendor to discuss what you did in the space during that time, what worked and didn't, and what you have planned in the next quarter. Ask the vendor to do likewise, which may result in learning the vendor's scheduled outages.

BUYERS' CHECKLIST

- ✓ Who owns the colocation facility?
- ✓ What are your short- and long-term plans for the facility?
- ✓ What options are in place for potential company growth and expansion?
- ✓ How much power and space do you need?
- ✓ Does the facility offer 24/7/365 customer service?

KEY TERMS

Cabinets, cages, and suites.

Terms used to describe how much space a company needs for its colocation resources. Cabinets are for companies that only need a small amount of space; suites, vaults, or rooms are required for larger-scale colocation needs.

Geographic risk mitigation.

The practice of selecting a colocation provider and facility based on the location of its data center. For instance, choosing a data center located in a region with a calmer climate vs. one located in a region that's prone to hurricanes, earthquakes, or other natural disasters.

Tape Media: Buying Used & Disposing Of Old

✓ Get Past The Fear Of Buying Used Tape Media

Tape manufacturers work hard to convince their customers not to buy used tape, but used tape vendors say that those warnings are nothing more than fear mongering designed to increase manufacturers' sales. Most tapes are designed to withstand thousands of mounts in a tape drive. However, many tapes are written to just once and then sit on a shelf for years before companies are ready to dispose of them. These cartridges have a lot of useful life left.

✓ Always Follow Good Tape-Handling Procedures

Certified used tape can be used for the same applications as new tape, and it doesn't require any special handling procedures. However, you should treat it with the same care that you would treat new media.

Tape manufacturers and resellers recommend that you store tapes vertically and never take apart the cartridges or touch the media with your bare fingers. In addition, you should avoid dropping the tapes and keep them away from magnetic devices, including monitors, speakers, electrical motors, and power supplies. You also shouldn't let your tapes get too cold or too hot, and when you move them from one place to another, you should wait 24 hours to let them adjust to the climate conditions before mounting the tapes.

✓ Evaluate Your Data Destruction Options

When getting rid of old tape media, you'll typically choose between an onsite or offsite service. With an onsite data destruction service, you'll remove the need to deal with a chain of custody documentation, which can become a legal burden and add complexity to the job. For data centers that store a lot of sensitive data and want to physically destroy the data, you'll enjoy the peace of mind that comes with watching the destruction take place. With an onsite data destruction service, the vendor will provide all the equipment necessary to handle your storage equipment.

Some data destruction services offer more powerful shredders at their facilities than mobile shredder services can offer. So if you want absolute destruction that's beyond any type of recovery, choose an offsite data destruction service.

A number of offsite data destruction services also double as a reprocessing center that can

remarket the parts, so you can get some return value for your used equipment.

✓ Partner With A Data Destruction Service

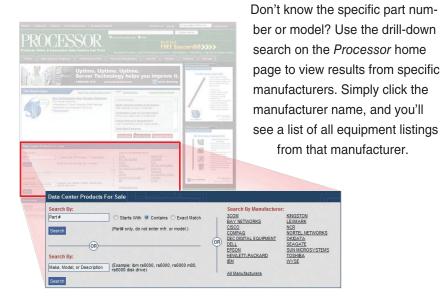
Qualified IT asset disposal vendors will assist your company and take over the responsibility for certification and compliance. Some of the current data compliance standards include those from the DoD (Department of Defense), NSA (National Security Agency), and NIST (National Institute of Standards and Technology). Most data destruction services also provide you with nondisclosure, confidentiality agreements so you can ensure that your data will be dealt with securely.

Another benefit of a data destruction service is that it can provide you with a variety of options for handling your various types of storage media. For example, let's say that you want to shred a bunch of old tape drives, CDs, and mobile phones, but you want to merely wipe the data off old hard drives so that they can be reused in other parts of your data center or donated to worthy causes. Most data destruction services offer you a combination of degaussing and shredding services in both onsite and offsite variations.

USE PROCESSOR.COM TO FIND DATA CENTER EQUIPMENT

Looking for help pinpointing the products you need, from vendors you can trust? Finding the equipment you need is easy with *Processor*'s online Data Center Products For Sale database.

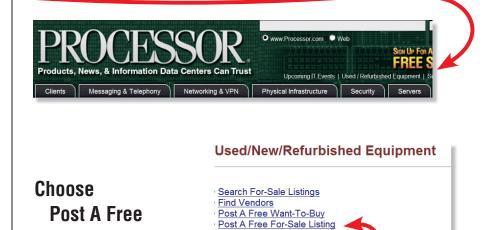
From *Processor*'s home page (www.processor.com), you can search for a specific part number, make, model, or description. Enter the information in the appropriate box and click Search. You'll see a list of available equipment. If you don't see the particular piece you're looking for, scroll to the bottom of the search results page to conduct a more detailed search. There, you can search by part number, model, price, location, and more.



Do you have excess equipment? Post it for sale on Processor.com!

On the Processor.com home page, click Used/Refurbished Equipment.

For-Sale Listing.



Follow the on-screen directions from there!

View Want To Buys

DCIM Solutions



DATA CENTER MANAGERS are eyeing DCIM (data center infrastructure management) solutions for the numerous benefits they can afford by providing a holistic view of data center and facilities infrastructures. Here are some of the key elements to consider when purchasing a solution.

✓ Know What DCIM Can Do

DCIM solutions enable IT to view real-time power and temperature usage data on a granular level and provide monitoring, management, automation, optimization, and capacity and budget planning capabilities, all of which lead to the streamlining of operations and improving energy consumption and overall efficiency. DCIM solutions can replace spreadsheets, paper records, CAD drawings, and similar tools traditionally used to track assets. Instead, enterprises gain real-time, in-depth views into physical and IT assets.

Other benefits include quick completion of company-required changes; the ability to receive complete capacity data for power, rack units, cooling, chassis, and network capacity consolidated into one system; less downtime; and precise views of capacity, trend, and environmental data for everyone to access.

✓ Find The Right Product

When comparing DCIM solutions, there are several questions you should answer, says Nicholas Peterson, director of marketing at Critical Power Exchange (877/630-7520; www.criticalpower.com). Perhaps the most important question is, "Are your tools appropriate for the job?"

Be sure to consider what your greatest need is and your ability to fully use the platform's tools. For example, determine whether you have the resources in place to address issues the DCIM solution uncovers and change the facility or operating procedures to enable improvements.

The maturing of the DCIM market means there are products suitable for even small enterprises. When evaluating vendors, look for ones that have forged strong links with the leading enterprise IT management vendors. In some cases, your existing power vendors may offer solutions. This would be a good starting point as you already trust them as vendors.

Don't forget that, with whatever DCIM application you choose, you need to have the infrastructure support to run and maintain the application, says Alex North, director of business development at BayTech (800/523-2702; www.baytech.net).

✓ Seek An Easy Migration

Rather than re-creating the wheel, seek out a DCIM solution that supports easily migrating existing data to the new system, says Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; www.rackmountsolutions .net). For example, if you're maintaining multiple spreadsheets, CAD drawings, and other diagrams, he says, "migrating that information into the DCIM solution easily will be a lifesayer."

The solution should allow managers to start small and work up to added levels of sophistication in phases, he says. "Flexibility can breed complexity, and while a full-featured DCIM solution can seem complicated, getting started doesn't have to be." A modular solution that enables initially buying what's needed and layering in additional features gradually is a nice benefit.

✓ Predict Before You Commit

Today's DCIM tools are able to "tell you where you are" with space, power, cooling, and networking, says Hassan Moezzi, CEO of Future Facilities (408/436-7701; www.futurefacilities.com). "People keep talking about infrastructure issues such as power and cooling, when in reality they are just a byproduct of the original cause," he says. "It's the IT equipment that's really the problem," he says, adding that "DCIM tools on their own are not really sufficient to address a moving target."

Future Facilities Product Manager Matt Warner says you need to have a tool with predictive capabilities that let you test "whatif" scenarios. That way, you can know what will happen if you raise the temperature, move or add equipment, or perform other tasks. Such a tool will let you "be more innovative in the data center because you can try things out before turning it live," he says.

BUYERS' CHECKLIST

- ✓ Plan for the future. A DCIM solution should support capacity and optimization planning, offering tools that help "determine future requirements for power, cooling, floor space, rack space, and contingency planning," says Brett Femrite, director of business development at Rackmount Solutions (866/207-6631; www.rackmountsolutions.net).
- ✓ Know what you're up against. Possible obstacles to acquiring a DCIM solution can include the company's finance department vetoing the purchase; departments having different solutions in mind, leading to paralysis; vendors not providing a solution priced for the small to midsized enterprise; lack of manpower needed to learn, implement, and oversee the solution; and poor or slow solution support. Before investing in DCIM, know how you'll handle these obstacles.

KEY TERMS

Corporate Average Data center Efficiency (CADE) and Power to Performance Effectiveness (PPE).

Two rating systems, created by McKinsey and Gartner, that go beyond power usage effectiveness (PUE) and account for IT energy efficiency. Both systems are designed to help IT managers address low server utilization, which is the biggest source of waste in data centers today.

Point solutions.

Many DCIM vendors offer only one or two DCIM components, or points, rather than an entire suite of DCIM tools.

PROCESSOR

Network With Your Peers

At These IT Training & Association Meetings

SALMON AGROSS The United States

RIVER AGROSS The United States

Badger Pk

JANUARY

AFCOM Greater Tampa Bay Chapter (Revised ASHRAE Guidelines)

Jan. 16, 12:30 to 4 p.m.

Certified Records Management

8331 State Road 33 North

Lakeland, Fla.

www.tampabayafcom.com

AITP Lehigh Valley

Jan. 16

The Starlight Diner

233 North Route 100

Allentown, Pa.

www.lv-aitp.org

BICSI Winter Conference

Jan. 20-24

Tampa Convention Center

333 N Franklin St.

Tampa, Fla.

www.bicsi.org/winter

AITP California Southland

Jan. 23

Garden Grove, Calif.

www.aitpcalsouthland.org

AITP Wheeling

Jan. 23

White Palace at Wheeling Park

1801 National Road

Wheeling, W.Va.

www.aitp-wheeling.org

ISSA Baltimore

Jan. 23

Concurrent Technologies Corp.

8530 Corridor Road

Savage, Md.

www.issa-balt.org

Fundamentals of Windows Server 2008 Network & Applications Infrastructure

Jan. 25

New Horizons DC

1331 F St. NW, Suite 240

Washington, DC

www.dcnewhorizons.com

Windows 8 Unleashed

Jan. 26

New Horizons Austin

300 Highland Mall Blvd., Suite 100

Austin, Texas

tinyurl.com/NHAustin12613

ISSA Inland Empire

Jan. 29, 6:30 to 8:30 p.m.

Coco's Restaurant

Upland, Calif.

ie.issa.org

FEBRUARY

Network + Certification

Feb. 4

New Horizons Tysons Corner 2010 Corporate Ridge, McLean, Va. www.dcnewhorizons.com

Office 2010 Tips & Tricks

Feb. 5

New Horizons Cincinnati

10653 Techwoods Circle

Cincinnati, Ohio

tinyurl.com/NHCincy2513

AITP Washington, D.C.

Feb. 14

Alfio's La Trattorio Restaurant

4515 Willard Ave.

Chevy Chase, Md.

www.aitpdc.org

Installing & Configuring Windows Client 7

Feb. 18

New Horizons DC

1331 F St. NW, Suite 240

Washington, DC

www.dcnewhorizons.com

Excel 2010 Tips & Tricks

Feb. 19

New Horizons South Dakota

4610 Technopolis Drive, Suite 100

Sioux Falls, S.D.

tinyurl.com/NHSD2-1913

AITP Lehigh Valley

Feb. 20

LCCC

4525 Education Park Drive

Schnecksville, Pa.

www.lv-aitp.org

Actic Pk

Baidy Pk

Castle Dome Pk

San Carlos

Reservoir

Reservoir

Mt Lemmon C

And Castle Top

And Castle

Upcoming IT Events



AITP Wheeling

Feb. 20

White Palace at Wheeling Park 1801 National Road

Wheeling, W.Va.

www.aitp-wheeling.org

New Features of Adobe CS6

Feb. 21

New Horizons Fort Worth 4100 International Plaza, Suite 200 Fort Worth, Texas

tinyurl.com/NHFortWorth22113

Now Footures

New Features of Adobe CS6

Feb. 21

New Horizons Dallas

150 W John Carpenter Freeway, Suite 100

Irving, Texas

tinyurl.com/NHDallas22113

Project Management

Feb. 25

New Horizons Tysons Corner
2010 Corporate Ridge
McLean, Va.
www.dcnewhorizons.com

ISSA Inland Empire

Feb. 26, 6:30 to 8:30 p.m.
Coco's Restaurant
Upland, Calif.
ie.issa.org

· Haystack Mt

AITP California Southland

Feb. 27

Garden Grove, Calif. www.aitpcalsouthland.org

MARCH

AITP Delaware

March 1, 5:30 to 8 p.m.
Wilson Graduate Center
31 Reads Way
New Castle, Del.

www.aitp.org/members/group_content_view .asp?group=75724&id=100570

SharePoint Technology Conference

March 3-6 San Francisco, Calif. www.sptechcon.com

AITP Washington, D.C.

March 14

Alfio's La Trattorio Restaurant 4515 Willard Ave. Chevy Chase, Md. www.aitpdc.org

Planning & Managing Windows 7 Desktop Deployment

March 18

New Horizons Tysons Corner, 2010 Corporate Ridge McLean, Va.

www.dcnewhorizons.com

AFCOM Greater Tampa Bay Chapter

March 20, 12:30 to 4 p.m. www.tampabayafcom.com

Configuring & Managing Microsoft SharePoint 2010

March 25

New Horizons DC, 1331 F St. NW, Suite 240

Washington, DC

www.dcnewhorizons.com

ISSA Inland Empire

March 26, 6:30 to 8:30 p.m.

Coco's Restaurant

Upland, Calif.

ie.issa.org

AITP California Southland

March 27
Garden Grove, Calif.

www.aitpcalsouthland.org

AITP Wheeling

March 27

White Palace at Wheeling Park
1801 National Road
Wheeling, W.Va.

www.aitp-wheeling.org

ISSA Baltimore

March 27

Concurrent Technologies Corp.

8530 Corridor Road

Savage, Md.

www.issa-balt.org

Do you have an event you'd like to see listed? Send an email to feedback@processor.com.



Why navigate through countless Web sites when you can get all the information you need in just a few minutes by reading *Processor*?

Processor's content is comprehensive, but it's presented in a quick, easy-to-read format, so you can keep up with the constant flood of new data center products and technologies.





PROCESSOR.

For more information, call (800) 334-7458 or go to www.processor.com.

Here are brief snapshots of several companies offering products designed for the data center and IT industry. Listings are sorted by category, making it easy for you to find and compare companies offering the products and services you need.

You can find more detailed information on these companies and the products they offer inside this issue.

To list your company and products, call (800) 247-4880.

PHYSICAL INFRASTRUCTURE



PDUsDirect.com is a Master Distributor of select Server Technology PDUs for server and networked environments. PDUs Direct's basic, metered, and switched Rack PDUs provide local and remote power management, power monitoring, and environmental monitoring. We pride ourselves in offering industrial-grade quality products at the lowest prices, with the fastest shipping (most orders shipped within 24 hours) and simplest purchase process. We are the Power Behind the Business.

Products Sold:

A complete line of metered and basic PDUs, and 20A switched PDUs.

(888) 751-7387 | pdusdirect.com

PHYSICAL INFRASTRUCTURE



The Mestex division of Mestek is comprised of seven company brand names: Applied Air, LJ Wing, Aztec, Alton, Temprite, Koldwave, and Sierra. Mestex is involved in emerging technology and product research focused on using energy and water more efficiently, including ways to improve data center efficiency by using outside air, evaporative cooling, and optimized DDC control schemes.

Products Sold:

- Mechanical and evaporative cooling products
- Heating products
- Outside air tempering products
- Packaged evaporative cooling solutions for missioncritical applications

(214) 819-5262 | www.mestex.com

PHYSICAL INFRASTRUCTURE



Rackmount Solutions' mission is to listen to the IT engineer's specific needs and deliver superb-quality, high-performance products through continuous product innovation and operational excellence. We pride ourselves in providing quality customer service, products that fit your IT requirements, and solid value for your money.

Products Sold:

- Wallmount and server racks and cabinets, including sound proof, air conditioned, and large cable bundle
- Desktop/tabletop portable racks
- Shockmount shipping cases
- Bulk cable

(866) 207-6631 | www.rackmountsolutions.net

PHYSICAL INFRASTRUCTURE



Cablesys, headquartered in La Mirada, California, is a leading manufacturer of high performance fiber cables, fiber jumpers, CAT 6 patch cords, CAT 5e patch cords, CAT 6 cables and connectivity solutions. We have millions in stock that can be shipped same day and best of all, 20% less than name brands.

Products Sold:

- Fiber Optic Cables
- Fiber Patch Cords
- · Networking Patch Cords
- Telephone Line Cords
- Audio and Video Cables
- · Mini Coax Cables

Custom Cable Assemblies:

- Pre-bundled Cable Assemblies
- Trunk Cable Assemblies
- Multi-strand Cable Assemblies
- · Pre-labeled and Pre-kitting
- OEM Cable Assemblies

(800) 555-7176 | Cablesys.com/pro

PHYSICAL INFRASTRUCTURE



LINDY USA specializes in cables, adapters, electronics and accessories for computer, networking and audio video applications. Since 1932 Lindy has supplied high quality interconnects to customers in commercial, telecom and residential markets. What sets us apart is our complete dedication to innovation, performance and reliability. Our cabling products are truly outstanding.

Products Sold:

 Networking Products • Audio / Video • KVM • Sharing, Converting, Extending • USB and FireWire • Input Devices • Add-On Cards • Hardware and Security • Power • Cabless • Adapters and much more!

(888)-865-4639 | www.lindy-usa.com/

PHYSICAL INFRASTRUCTURE

PDU ****** Cables™ Innovator in data center efficiency

PDU Cables is the leading supplier of power distribution cables assemblies to data centers in North America. PDU Cables has been serving this industry since 1981 and is the first independent cable assembly company to introduce colored conduit into the power distribution cable market, the first to get UL 478 listing, and the first to introduce the Power Cable and Equipment Configurator software tool. The company is centrally located in Minneapolis, Minn., allowing it to offer 24-hour turnaround and shipping time of just one or two days to almost any United States destination.

Products Sold:

A range of power cables, cable seals, and power cord assemblies.

(866) 631-4238 | www.pducables.com

PHYSICAL INFRASTRUCTURE



Upsite, the "Pioneering Company in Airflow Management Solutions" was founded by Ken Brill, who established the Uptime Institute, a think tank dedicated to identifying efficiencies within data centers. Upsite's LOK Family of energy-efficient solutions are engineered to optimize the data center. This sets Upsite apart. Upsite solutions empower data center managers to leverage cost savings for data center optimization (i.e. releasing stranded capacity, increasing server density, improving system reliability & reducing energy consumption).

Products Sold:

- KoldLok
- AisleLok
- HotLokEnergyLok

(505) 798-0200 or (888) 982-7800 | I www.upsite.com

PHYSICAL INFRASTRUCTURE

Page 45



Founded in 1995, Austin Hughes Electronics Ltd is a design and manufacturing group that offers a broad range of solutions based around 19 inch rack mount technology. With a wealth of experience Austin Hughes design and development teams are focused to rapidly transform customer requirements and market trends into saleable solutions.

Products Sold:

- Infra solution Cabinet Smartcard Handels
- · InfraPower Cabinet Intelligent PDUs
- CyberView Rackmount KVM & LCD Console Drawer
- Environmental Sensors

(510) 794-2888 I www.Austin-Hughes.com

PHYSICAL INFRASTRUCTURE



Future Facilities Incorporated aims to help enterprises improve and manage their mission-critical data centers. Its multifaceted software suite called 6SigmaDC supplies comprehensive 3D modeling of every aspect of data center layout, cooling, power, and even weight. Partners include Intel, Cisco, Dell, and HP.

Products Sold:

 ${\it 6SigmaDC\ data\ center\ modeling\ and\ simulation\ software}$

(408) 436-7701 | www.futurefacilities.com

PHYSICAL INFRASTRUCTURE



Critical Power Exchange buys and sells mission-critical backup power and cooling system equipment typically used in computer rooms, datacenters and other industrial applications. Founded in 1993, CPE is your single point of contact for disposal or acquisition of reliable datacenter, environmental and mission-critical power equipment.

Products Sold:

- Generators
- Raised Access Flooring
- TransformersUPS Systems
- Switchgear
- Power Distribution Units
- Fire SuppressionAir Conditioners

(877) 630-7520 I www.criticalpower.com

PHYSICAL INFRASTRUCTURE



Since 1979, Simplex Isolation Systems has been setting new design standards in modular expandable cleanroom components, isolation curtains, hardware, and new product development. Fontana, Calif.,-based Simplex's unique strip doors and mounting systems are designed for quick installation. Simplex parts and materials perform with optimum efficiency, last longer, and save you money. And with Simplex, you are always backed by industry expertise, product knowledge, and the best warranties in the market.

Products Sold:

- Cleanrooms
- Strip doorsCurtains
- Enclosures

(877) 746-7540 I www.simplexisolationsystems.com

PHYSICAL INFRASTRUCTURE



AVTECH Software, founded in 1988, is focused on making the monitoring and management of systems, servers, networks, and data center environments easier. AVTECH provides powerful, easy-to-use software and hardware that saves organizations time and money while improving operational efficiency and preparedness. AVTECH products use advanced alerting technologies to communicate critical status information and can perform automatic corrective actions.

Products Sold:

A full range of products that monitor the IT and facilities environment, including temperature, humidity, power, flood, room entry, and UPS

(888) 220-6700 I www.AVTECH.com

PHYSICAL INFRASTRUCTURE



Total Cable Solutions (TCS) provides a wide range of products from copper keystone jacks to custom bundled fiber cables. All products are manufactured with TCS's highest quality, in factories that are ISO-9001 and TUV Certified. All of our cable lines meet or exceed EIA/TIA RoHs standards.

Products Sold:

- · Fiber patch cords
- Pre-terminated multi-fiber trunk cables
- CAT5e and CAT6 patch cables
- Fiber and copper patch panels
- Keystone jacks, and other accessories

(888) 235-2097 | www.TotalCableSolutions.com

PHYSICAL INFRASTRUCTURE



LANSTAR is a worldwide supplier and manufacturer of durable and innovative Technical furniture. All LANSTAR systems are expertly engineered to be interchangeable providing unparalleled flexibility and value. Our Professional staff, with a consultative sales approach, has been designing and providing solutions that are space effective and increase efficiency in the network environment. Let LANSTAR customize your system to fit virtually any need.

Products sold:

- Computer cabinets
- USB port blockers Raised flooring
- Rackmount cabinets
- PDU's
- KVM switching

LAN racks

AV swithces

(800) 474-3947 | www.lanstar.com

PHYSICAL INFRASTRUCTURE



RackSolutions has been serving the data center market for more than 10 years. All of our products are designed, engineered, built, and shipped under our own roof. We have product solutions available for every major OEM, but if one of our existing products doesn't fit your needs, our top-notch mechanical and electrical engineers can create the item you need from scratch, solving even the toughest installation design challenges. Best of all, we typically don't charge up-front fees for design services.

Products Sold:

Computer server racks, cabinets, shelves, and mounting products.

(888) 903-7225 | www.racksolutions.com

PHYSICAL INFRASTRUCTURE



BayTech was founded in 1976 and, since the 1990s, has developed unique products for remote power management. The company uses printed circuit board instead of wires for a better, more resilient connection between the data center equipment and the receptacle. BayTech provides an extensive Web site with brochure downloads, warranty information, and reseller support and also offers evaluation units for data centers.

Products Sold:

- · Power control, distribution, management, and metering
- · Power transfer switches
- · Console management and remote site management

(800) 523-2702 | www.baytech.net

PHYSICAL INFRASTRUCTURE



As an integrator and master distributor providing quality power solutions, HM Cragg has built a reputation as the company that delivers innovation to aid and satisfy its customers. HM Cragg was founded in 1968 and is 100% employeeowned, focusing on quality people and exceptional products.

Products Sold:

- AC and DC power solutions (UPSes, power distribution)
- Control and monitoring (environmental and power)
- · Connectors and cables (cord sets, ePDU cables)
- Cooling (air flow management, portable cooling)
- · Racks and enclosures (standard racks, battery racks)
- Safety equipment (spill containment, safety signs)

(800) 672-7244 I www.hmcragg.com

PHYSICAL INFRASTRUCTURE

SENSAPHONE®

Sensaphone has been designing and manufacturing remote monitoring systems for more than 25 years and has more than 300,000 of its products in use. Sensaphone's product lineup offers a full range of devices with a broad number of features and applications designed to monitor your entire infrastructure and alert you to changes. All product engineering functions, including hardware and software design and circuit board layout and assembly, are performed at the Sensaphone facility in Aston, Penn.

Products Sold:

Remote monitoring solutions that provide email and voice alarm notification for problems related to temperature, humidity, water detection, power failure, and more.

(877) 373-2700 I www.sensaphone.com

NETWORKING & VPN



Alvaco Networks specializes in load balancing technology. Our expertize allows us to meet the needs of any network, from basic to highly sophisticated. We have a proven track record for resolving network and balancing applications for small, medium, and large size companies.

Products Sold:

- Load Balancer Systems
- VPN AggregatorsCell Technology
- Access Routers
- Access Houters
- Firewall/Broadband

(407) 574-2017 | www.alvaco.com

PHYSICAL INFRASTRUCTURE



Based in New York City, Hergo Ergonomic Support Systems is an independent designer and manufacturer of enclosure cabinet solutions, technical computer furniture, and modular racking systems. The company's products are designed to promote organization in the workspace and to increase the productivity of computers, peripherals, and communications equipment. Hergo is known for its high-quality products and superior customer service.

Products Sold:

- Racks
- Computer desks
- Enclosures/cabinets
 Cable management
- Motorized workstations
- Power management
- Flat-panel arms

(888) 222-7270 | www.hergo.com

PHYSICAL INFRASTRUCTURE

🛂 Atlas Sales & Rentals, Inc

THE PORTABLE COOLING & HEATING SPECIALIST

Atlas has specialized in portable air conditioning since 1979 and leads the industry in server room and data center portable cooling. We offer "24/7" response from companyowned, full-service offices around the country, each stocked with a wide inventory of equipment for primary, supplemental, or emergency cooling. All portable items are available for sale or rental. Atlas is a Preferred MovinCool® Distributor and a GSA Certified MAS Contractor.

Products Sold:

- 1-5 ton portable air conditioners, air and water-cooled
- 12-ton portable coolers designed to roll through a standard doorway
- Ceiling-mount air conditioners full line of MovinCool® packaged a/c units

(800) 972-6600 | www.AtlasSales.com

PHYSICAL INFRASTRUCTURE



Server Technology is committed to the PDU market with the largest group of engineers dedicated to power distribution and other solutions within the equipment cabinet. Advancements in device power monitoring help data centers monitor and improve their efficiency, and continuous research and development is fueled by companies that look to Server Technology for their custom cabinet power solutions.

Products Sold:

A complete line of cabinet PDUs, including Per Outlet Power Sensing (POPS), Rack Mount Fail-Safe Transfer Switch, Console Port access with remote power management, Switched, Smart, Metered, Basic, and -48 VDC

(800) 835-1515 | www.servertech.com

STORAGE



Founded in 1991, Aberdeen is a leading manufacturer of servers and storage options for IT departments. Aberdeen products can be found in many of today's high-tech corporations, as well as government agencies, hospitals, and universities. Aberdeen prides itself on unmatched customer service, open and honest communications, long-term commitments to working relationships, and personal and professional integrity.

Products Sold:

- Components/parts
- Servers (barebones, custom, rackmount, and storage)
- Software
- Storage (DAS, iSCSI SAN, JBOD, NAS, SAN)

(800) 500-9526 | www.aberdeeninc.com

STORAG



As the storage architecture authority, Area Data Systems has a 25-year track record of success built on the ability to deliver its clients cost effective, reliable and scalable storage for Cloud and Big Data solutions.

Area Data believes that storage solutions are not a one size fits all paradigm. The Area Data solution cycle employs an "engineer-to-engineer" approach to discover potential challenges to success for clients. Area Data will design, validate and recommend the appropriate industry certified storage solutions tailored to the needs of each client, based upon real world performance testing.

Products Sold:

Storage solutions

(714) 993-0300 I www.AreaSys.com

STORAGI

SEPATON®

For IT organizations that manage extremely large and growing volumes of data, Sepaton delivers the fastest, most scalable and most reliable enterprise backup and recovery solution in the world. Sepaton delivers performance of up to 400% faster than leading competitors, moving data to safety at an unmatched 43.2 TB per hour! Built on our patented DeltaScale™ architecture, Sepaton easily handles massive volumes of data, seamlessly scales to accommodate rapid growth and consistently meets the tightest of backup windows. Sepaton is headquartered in Marlborough, Massachusetts, and was founded in 2003.

Products Sold:

 A range of enterprise data protection products, with capacity from 10TB up to 2PB.

(866) 737-2866 I www.sepaton.com

SERVERS

Supermicro[®] (NASDAQ: SMCI), the leading innovator in high-performance, high-efficiency server technology, is a premier provider of advanced server Building Block Solutions[®] for enterprise IT, data center, cloud computing, HPC, and embedded systems worldwide. Supermicro is committed to protecting the environment through its "We Keep IT Green[®]" initiative by providing customers with the most energy-efficient, environmentally-friendly solutions available on the market.

Products Sold:

- Servers
- Network switches GPU servers
- Motherboards Storage solutions Embedded
- ChassisBlade servers

(408) 503-8000 I www.supermicro.com

CLIENTS



The Smart Choice for Text Retrieval® since 1991, dtSearch® offers over 21 years of experience in parsing and searching data. The dtSearch product line includes enterprise and developer text search products, meeting some of the largest-capacity text retrieval needs in the world. dtSearch's website offers hundreds of developer case studies and press reviews. The company has distributors worldwide, including coverage in six continents.

Products Licensed:

Text retrieval products, including:

- · Desktop with Spider
- Web with Spider
- Network with Spider
- Engine for Win & .NET
- Publish (for portable media)
 Engine for Linux

(800) IT-FINDS | www.dtsearch.com

ERVICES



Data Specialties Inc. (DSI) is a nationwide data center design-build firm with over 20 years experience. Office locations include Los Angeles, Orange County, Phoenix, Sacramento, San Diego and St. Louis, with licensing in over 20 additional states. Call 1-800-454-5164 or visit www.WeBuildDataCenters.com for more information.

We Build Data Centers Nationwide

Data Center Services:

- Design/Build
- Maintenance program
- Upgrades/Expansion
- Electrical/Communications cabling

Relocation

800-454-5164 I wwww.WeBuildDataCenters.com

EQUIPMENT DEALER



NeweggBusiness is the business-to-business division of Newegg Inc., specializing in providing IT and office products. NeweggBusiness was formed in 2009 as an initiative to satisfy the growing needs of businesses, government, healthcare organizations, and educational institutions. Businesses and organizations can take advantage of features such as Net 30 Day terms, volume discounts, low-cost bulk shipping, and live inventory status.

Products Sold:

More than 60,000 office and computer products, including servers, desktops, notebooks, tablets, printers, scanners, monitors, network switches and routers, memory, mother-boards, and software.

(888) 978-8988 I www.neweggbusiness.com

EQUIPMENT **D**EALER



In 1987, Pegasus Computer Marketing started providing mainframe products to the end-user market. What began as a sales-only organization soon adapted to offer in-house repair and refurbishment. During the past 10 years, Pegasus has focused primarily on the point-of-sale and barcode industries, buying, selling, and providing service contracts for anywhere from a few scanners to hundreds.

Products Sold:

We buy, sell, and service:

- Point-Of-Sale Equipment and POS/PC Flat Panels
- Wired and Wireless Barcode Hardware
- Kronos Time Clocks and Accessories

(800) 856-2111 $\,$ I $\,$ www.pegasuscomputer.net

PROCESSOR Subscribe Today! Call (800) 334-7458 Subscribe Online! Go to www.processor.com Network Sector Products, News & Information Network Sector Ne

Attention Data Center Professionals

Where do you go to find the newest products available?

Check out each issue for ...

- > Information on companies you need to know.
- > Quick rundowns of new data center-related products.
- > Articles with valuable product overviews and data.

... then go to Procesor.com and take advantage of our online search tools to find even more in-depth information!

PROCESSOR.



Right Here!

All In A No-Nonsense Format

Product Overviews • Leading Manufacturers • Technology News & Information



Don't Miss A Single Issue.

Call 800-334-7458 or go to www.processor.com